US Army Corps of Engineers®
New Orleans District

NATIONAL REGISTER TESTING OF A RAILROAD EMBANKMENT FOR THE HOLLYGROVE DRAINAGE IMPROVEMENTS FEATURE, SOUTHEAST LOUISIANA URBAN FLOOD CONTROL PROJECT, ORLEANS PARISH, LOUISIANA

Final Report

August 2001

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REPLY TO
ATTENTION OF:

September 6, 2001

Planning, Programs, and
Project Management Division
Environmental Planning and
Compliance Branch

To The Reader:

This cultural resource effort was designed and guided by the U.S. Army Corps of Engineers, New Orleans District, as part of our cultural resource management program. The contractor, Earth Search, Inc., conducted a thorough archeological investigation of the remains of a railroad embankment in New Orleans. We concur with the findings and recommendations in the report. The Louisiana State Historic Preservation Officer also concurs with the conclusions and recommendations. The contractor is to be commended for outstanding performance during this project

Kenneth A. Ashworth
Contracting Officer's
Representative

David F. Carney
Chief, Environmental
Planning and Compliance
Branch

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National Register Testing of a Railroad Embankment for the Hollygrove Drainage Improvements Feature of the Southeast Louisiana Urban Flood Control Project, Orleans Parish, Louisiana		DACW29-97-D-0016 Delivery Order 16
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Earth Search, Inc., was contracted by the U.S. Army Corps of Engineers, New Orleans District (NODCOE), to conduct National Register (NRHP) testing of an historic railroad embankment in the Hollygrove neighborhood of New Orleans in support of construction of the Hollygrove Drainage Improvements feature of the Southeast Louisiana Urban Flood Control Project. The project area is comprised of a linear parcel of land measuring approximately 840 m (2755.2 ft) in length and 12 m (39.6 ft) in width, or approximately 25 acres. Although it was expected that the remains of cribwork for support of the railroad crossties would be preserved within the embankment, it appears that cribbing was never in fact utilized along that portion of the embankment within the project area. Instead, it appears that logs from trees felled during clearing the swamp for the railway were utilized to form the base of the embankment. Features associated with this initial construction were found within the horizon of the backswamp that originally occupied the Hollygrove neighborhood in Trenches 1 through 6, and they appeared to be best preserved in Trenches 3 and 4. Subsequently, vertical pilings were utilized to stabilize the embankment along the majority of its course; only those portions adjacent to the former Oleander Canal were devoid of pilings. Excavation of six trenches and 18 exploratory areas, in conjunction with extensive archival research, has thus yielded considerable data on the engineering, construction and maintenance of the railroad embankment. It is the contractor's opinion that NRHP test excavations have exhausted the research potential of the embankment, and that further excavations are unlikely to yield additional information. Consequently, site 16OR152 is ineligible for nomination to the National Register of Historic Places. No additional archeological investigations are recommended. Furthermore, because of the nature of the planned construction, archeological monitoring is unlikely to be of any utility. No further work is recommended.

Railroad construction; railroad engineering; embankment; New Orleans, Jackson, and Great Northern Railroad; Illinois Central Railroad; cribbing; cribwork; historical archeology; industrial archeology; Hollygrove; remote sensing; thermal imaging	195

Unclassified	Unclassified	Unclassified	UL

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CHAPTER 1
INTRODUCTION

Earth Search, Inc., was contracted by the U.S. Army Corps of Engineers, New Orleans District (NODCOE), to conduct National Register (NRHP) testing of an historic railroad embankment in the Hollygrove neighborhood of New Orleans in support of construction of the Hollygrove Drainage Improvements feature of the Southeast Louisiana Urban Flood Control Project. The project area is comprised of a linear parcel of land measuring approximately 840 m (2755.2 ft) in length and 12 m (39.6 ft) in width (Figure 1). It is located in Orleans Parish immediately inside the Jefferson-Orleans Parish line. The NODCOE plans to construct an underground drainage canal in order to ameliorate flooding of the surrounding neighborhood. The current investigations were undertaken to (a) locate any archeological resources preserved within the project area, (b) define the boundaries of those resources, (c) gather data sufficient to assess the National Register status of those resources, and (d) assess the effects of canal construction on those features. Fieldwork was conducted between June 22 and August 27, 1999, and consisted of remote sensing, mechanical trench excavation, and delineation and recordation of features.

Within the project area, between the corners of Eagle and Forshey streets and Live Oak and Pritchard streets, there is a noticeable rise in the landscape, which is the remnant of the New Orleans, Jackson, and Great Northern Railroad (N.O.J. & G.N.R.R.) right-of-way. Otherwise flat, this portion of the Hollygrove neighborhood rises approximately 0.7 m (2.3 ft) to 1.6 m (5.4 ft) above the surrounding neighborhood. The defunct railway embankment has been abandoned for decades, and the land is currently utilized for green space, parking, and garbage disposal. This historic railroad embankment has been designated 16OR152.

Cultural debris was encountered throughout the project area. Each trench excavated contained numerous artifacts in the first stratum, which included modern trash mixed with historic ceramic, glass, and metal. Each trench also contained wooden structural features of the original and subsequent maintenance and building episodes of the N.O.J. & G.N.R.R. (later Illinois Central Railroad). Given the lack of research potential beyond that which has been collected during NRHP testing and exhaustive literature search, it is the contractor's opinion that this site is ineligible for inclusion on the National Register of Historic Places. No further archeological excavations are recommended.

Report Organization

Chapter 2 presents the natural and environmental setting of the project area. Chapters 3 and 4 present prehistoric and historic overviews of the project area, respectively. Chapter 5 is an extensive review of the railroad, including discussion of engineering. Chapter 6 presents previous archeological investigations in Orleans Parish. Field methodology and results are presented in Chapter 7, and artifact analyses are presented in Chapter 8. Recommendations are provided in Chapter 9.

CHAPTER 2
NATURAL SETTING

Geological Setting

The project area is located on the east or left descending bank of the Mississippi River within a portion of the delta plain which was deposited only a few thousand to a few hundred years ago. The delta plain consists of six major Holocene delta complexes, each experiencing a constructive phase and then undergoing a destructive phase. Some evidence indicates that older complexes and lobes are also buried by these six younger delta complexes. Four of these complexes (the Maringouin, Teche, St. Bernard, and Lafourche) are in various stages of deterioration. Two of these complexes (the Modern and Atchafalaya) are actively prograding. The project area is associated with the Modern complex (Mossa 1991).

Near-surface deposits in and around the project area are a product of the St. Bernard and Modern Delta complexes and the corresponding meander belts of the Mississippi River. The St. Bernard complex ranges in age from 4500 years B.P. to about 1800 years B.P. The Modern or Plaquemines-Balize delta complex initiated approximately 950 years B.P., and is actively prograding at present. Much of the St. Bernard and Modern delta complexes have been deposited in a subdelta environment. However, the project area has principally been influenced by deposition adjacent to the Mississippi River (Frazier 1967; Mossa 1991).

Geologic environments recognized in the vicinity of the project area vary according to investigator. Fisk (1947) identified point bar deposits, top stratum and slough, abandoned channels, chute cut-offs and neck cut-offs, natural levee deposits, and backswamp deposits. Kolb (1962) mapped natural levee, inland swamp, fresh water marsh, fresh to brackish water marsh, saline to brackish water marsh, floating marsh, abandoned course or distributary, recent point bar deposits (sandy deposits), and ancient point bar deposits (silty deposits). The environment located in the project area is backswamp deposits (Trahan 1989).

Human modifications to the natural environment began in the eighteenth century with the construction of artificial levees to contain the Mississippi River. The first levee was completed in 1729. By 1735, artificial levees on both side of the river extended approximately thirty miles upstream and twelve miles downstream from New Orleans. These levees were extended as far as Baton Rouge on the left bank and Morganza on the right bank by the second decade of the nineteenth century. Even with this protection, New Orleans was regularly inundated due to crevasses in the artificial levees. The response to this situation was to build larger and higher levees which actually made subsequent floods more devastating when the water eventually flowed over the crest of the levee or rushed through crevasses (Elliot 1932; Franks and Yakubik 1991; Mossa 1991).

Soils

The primary soil unit mapped in the project area is Harahan Clay. This poorly drained soil is located in low portions of the Mississippi River floodplain in former swamps. The soil is firm in the upper part and slightly fluid and very fluid in the lower part. Slope is less than 1 percent. Typically, this soil has a black clay surface layer about 6 inches thick. The subsoil extends to a depth of approximately 36 inches and is gray, firm clay. The substratum extends to a depth of about 72 inches and is gray, slightly fluid and/or very fluid. Logs and stumps are in the underlying material in places. Harahan Clay is protected from most flooding at the present by levees and is drained by pumps. Under normal conditions, the water table is approximately 1 to 3 feet below ground surface. Water and air move through the soil at a very slow rate, and flood water runs off the surface slowly. This soil is high in fertility and has a very high shrink-swell potential and a

medium total subsidence potential (Trahan 1989). A typical pedon of Harahan Clay is described below (Trahan 1989:50):

A Horizon (0-6 in). Black (10YR 2/1) clay; moderate medium subangular blocky structure; firm; common fine roots; medium acid; clear wavy boundary.

Bg1 Horizon (6-20 in). Gray (5Y 5/1) common medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; firm; few fine roots; few slickensides that do not intersect; medium acid; clear wavy boundary.

Bg2 Horizon (20-36 in). Gray (5Y 5/1) clay; weak coarse subangular blocky structure; firm; few fine roots; slightly acid; clear smooth boundary.

Abg Horizon (36-40 in). Very dark grayish brown (10YR 3/2) mucky clay; weak medium subangular blocky structure; slightly fluid; few wood fragments; slightly acid; clear smooth boundary.

Cg1 Horizon (40-57 in). Gray (5Y 5/1) clay; massive; slightly fluid; neutral; clear smooth boundary.

Cg2 Horizon (57-72 in). Gray (5Y 5/1) clay; massive; very fluid; moderately alkaline.

Geoarcheology

The Harahan Clay soil unit occupying the project area is indicative of backswamp environments that occur behind (away from) the natural levees flanking the channels of either the Mississippi River. The former stream course is near the project area and could influence prehistoric and/or historic occupations by injecting sandy or silty deposits in the backswamps during flood episodes or crevasses. Regular deposits of these sands and silts in the backswamp could potentially fill or at least partially fill the backswamp and create new land for human occupation. Otherwise, the backswamp environment has a relatively low potential for human occupation prehistorically except for short-term exploitation, which may or may not have a material expression. Also, the acidity noted in the typical Harahan Clay pedon (described above) would tend to destroy non-lithic archeological artifacts, such as bone, leaving a limited material culture assemblage. These material assemblages would contribute very little to our understanding of prehistoric occupations in the project area. It should be noted that the acidity of the clay could be mitigated in certain circumstances, such as the development of shell middens through human agency. Site occupation potential for the project area during the early historic period would be very similar to that for prehistoric occupations. Site potential for historic occupation should rise after the construction of the New Orleans drainage system.

Biological Setting

The Mississippi River delta region within which New Orleans is situated is characterized by a set of ecological parameters that are integrated into a dynamic ecosystem with enormous biological productivity. The prime integration feature of this ecosystem is water. Primary units of the system are forests, fresh water marshes, brackish marshes, saline marshes and the offshore area (Bahr and Hebrard 1976:1-3; Bahr et al. 1983).

Climate

New Orleans is located within the subtropics, and its weather is strongly influenced by the nearby Gulf of Mexico. Rainfall exceeds 160 cm (64 in) annually. Periods of greatest rainfall generally occur in August and September. October is, on average, the driest month. The mean

annual temperature is about 21° Centigrade (70° Fahrenheit), with a mean low in January averaging 11° Centigrade (52° Fahrenheit) and a mean high in July of about 29° Centigrade (84° Fahrenheit). The growing season exceeds 260 days (White et al. 1983:103).

Hurricanes and storm surges occur intermittently, and these have profound effects on floral, faunal and human communities. Although these storms are natural calamities, they also produce beneficial effects. Large amounts of sediments and nutrients are deposited into coastal estuaries, resulting in both short- and long-term increases in primary productivity (Bahr et al. 1983:22).

Hurricanes and tropical storms are characterized by low barometric pressure. This causes a significant rise in sea level. In combination with winds up to 200 or more km/hr, storm surges as great as 7 m (23 ft) can drive ocean and lake water a considerable distance inland. The flooding problem is aggravated by accompanying tropical rains (Bahr et al. 1983:23).

Plant Communities

Prior to cultivation and urbanization of the New Orleans area, upland forests would have occupied most of the natural levee. Upland forest habitat would have graded to bottomland hardwood as elevation declined and flooding frequency thereby increased. Similar plant communities remain present on the Pleistocene terrace north of Lake Pontchartrain. Natural climax vegetation in such forests is dominated by mixed deciduous and evergreen trees that are less tolerant of flooding than are bottomland hardwood species. Woody species in a natural levee forest included oaks (*Quercus virginiana, Q. alba, Q. nigra*), shagbark hickory (*Carya ovata*), hackberry (*Celtis laevigata*), sweetgum (*Liquidambar styaciflua*), pecan (*Carya illinoiensis*), magnolia (*Magnolia spp.*), and various pines (Bahr et al. 1983:82).

As elevation declines at the edges of the natural levee, distinctively different plant communities occur. One of these is a "hardwood bottoms" community. The "cypress-tupelo" forests are located at slightly lower elevations. An intermediate swamp is sometimes located between these two communities. Large tracts of marsh occur in surrounding areas. Elevation of the land dramatically affects distribution and composition of plant communities within the area. Differences of only a few centimeters in elevation are associated with striking changes in vegetation. This is largely the result of the effects of soil saturation (White et al. 1983:102-103; Bahr et al. 1983:43-45).

Hardwood bottom forests in the area are dominated by the water oak (*Quercus nigra*). Subdominants include the sweet gum (*Liquidambar stryaciflua*), hackberry (*Celtis laevigata*), and live oak (*Quercus virginiana*). Other forest species include the box-elder (*Acer negundo*), honeylocust (*Gleditsia triacanthos*), American elm (*Ulmus americana*), and the Nuttall oak (*Quercus nuttallii*). The most common shrub species are palmetto (*Sabal minor*) and green haw (*Crataegus viridis*), but thickets of possum-haw (*Ilex decidua*) also occur. Within forest gaps, elderberry (*Sambucus canadensis*) and French-mulberry (*Callicarpa americana*) occur. Introduced species such as the camphor tree (*Cinnamon camphora*) are also present (White et al. 1983:103-104).

Vines are found throughout the bottomland forest, and few trees are observed without them. The most common of these include poison-ivy (*Rhus toxicodendron* var. *vulgaris*), Virginia creeper (*Parthenocissus quinquefolia*), supple-jack (*Berchemia scandens*), pepper-vine (*Vitis rotundifolia*), muscadine (*Vitis rotundifolia*), and hemp-weed (*Mikania scandens*) (White et al. 1983:104). Herbaceous ground cover is generally absent.

The cypress-tupelo swamps, located at lower elevations, are dominated by bald cypress (*Taxodium distichum*). Water tupelo (*Nyssa aquatica*) is often either a sub- or co-dominant species. Red maple (*Acer rubrum* var. *drummondii*) and ash trees (*Nyssa aquatica*) represent the

other sub-dominants in this community. Shrubs include wax-myrtle (*Myrica cerifera*) and button-bush (*Cephalanthus occidentalis*), while vines are cat-briar (*Smilax* spp.), trumpet-creeper (*Campsis radicans*), and poison ivy. Herbaceous ground cover, absent in the bottomland community, includes smart-weed (*Persicaria punctata*), alligator-weed (*Alternanthera philoxeroides*), swamp potato (*Sagittaria lancifolia*), and water hyacinth (*Eichhornia crassipes*) (White et al. 1983:105). Maps from the eighteenth and nineteenth century indicate that dense cypress forests stood between settled areas of the natural levee and Lake Pontchartrain.

An intermediate swamp forest sometimes occurs between the hardwood bottom forest and the swamp forests. It can be extensive due to the gradual slope of the land. Swamp red maple, American elms, and water oaks are common here. Palmettos create a dense understory, which is nearly impenetrable in some locations (White et al. 1983:105).

The other predominant plant community in the vicinity of New Orleans occurs in the marsh areas. Marshes are categorized according to their degree of salinity. The areas covered by the various marsh communities varied through the period of prehistoric occupation due to variation in fresh water influx compared to salt water intrusion.

The ecological distinction between a swamp and a marsh is the absence of trees in the latter. Marsh soils are peat and muck. Elevation of these is less than one meter above mean sea level in the vicinity of the study area. In the brackish or intermediate marsh, cord grass (*Spartina patens*) is dominant, while swamp-potato (*Sagittaria lancifolia*) predominates in freshwater marsh. Numerous other species co-occur with these (White et al. 1983:106-107).

Fish

Although the Mississippi River supports various species of freshwater fish, it is relatively unproductive because of high turbidities and strong currents. Freshwater sport species presently exploited in the vicinity of the project area include largemouth bass, spotted bass, yellow bass, black and white crappie, bluegill, spotted sunfish, and redear sunfish, as well as warmouth, channel, flathead, and blue catfish. Commercially exploited fish include catfish, bowfin, carp, gars, and buffaloes (U.S. Army Corps of Engineers 1984:16-17).

Waters in the estuaries in the vicinity of New Orleans host a diverse assemblage of species of fish. These species are highly mobile, and seasonal movements of fish populations are widespread. The result is that marine fish penetrate inland to fresh water habitats, while fresh water species are sometimes found in more saline environments. Also, the lower reaches of freshwater streams probably serve as nursery areas for the young of some marine species (Bahr and Hebrard 1976:69).

Birds

At least 216 species of birds are known to occur in estuary and swamp areas in the vicinity of New Orleans. Approximately 43% of these are passerines. Some species of this group are permanent residents, while others are only present seasonally. The remainder of the 216 species are predominantly waterfowl, many of which are migratory. Due to New Orleans' location near the terminus of the Mississippi flyway, which is the largest waterfowl migratory route in North America, birds represent a potentially abundant source of food, feathers, and bone for tools (Bahr and Hebrard 1976:6-7, 78-115).

Mammals

Important fur-bearing species present in the vicinity of New Orleans include the muskrat (*Ondatra zibethicus*), raccoon (*Procyon lotor*), mink (*Mustella vison*), and otter (*Lutra canadensis*).

Other mammals known to occur in the area include the Virginia opossum (*Didelphis virginiana*), the non-indigenous nine-banded armadillo (*Dasypus novemcinctus*), the swamp rabbit (*Sylvilagus aquaticus*), the fox squirrel (*Scirus niger*), the fox (*Vulpes fulva*), the bobcat (*Lynx rufus*), the beaver (*Castor canadensis*), the civet cat or spotted skunk (*Spilogale putoris*), and the white-tailed deer (*Odocoileus virginianus*). In addition, several species of terrestrial rodents and of bats are endemic (Bahr and Hebrard 1976:118-126). The mammalian faunal inventory would have been even more extensive during the prehistoric period (Speaker et al. 1986:26-29).

CHAPTER 3
PREHISTORIC OVERVIEW

This chapter presents a brief overview of Native American culture history in southeastern Louisiana. In general, few sites dating to the Paleo-Indian or Archaic Periods have been reported in southeastern Louisiana (Gagliano 1963; Gagliano and Saucier 1963). Although land formation was occurring in the study area during the Archaic period, evidence indicates that human occupation occurred subsequent to maximum development of the distributary network. Additionally, Paleo-Indian and Archaic period sites are likely to have been deeply buried or destroyed by subsequent riverine processes.

The Poverty Point Period (1500 B.C. to 500 B.C.)

The earliest known site in Orleans Parish is dated to the Poverty Point Period. It is known as the Linsley site (16OR40) and is situated on a buried natural levee associated with an earlier course of the Mississippi River. Material dredged from the subsided *Rangia* midden was used to define the Bayou Jasmine-Garcia Phase of the Poverty Point Culture (Gagliano et al. 1975:44-47). A series of radiocarbon dates and baked clay balls are evidence that link the site with the Poverty Point period (Weinstein 1978:A/23-A/25; Thomas 1982:3).

The name "Poverty Point" is derived from the type site, an area of massive earthwork construction, in northeastern Louisiana. This site is believed to have been a cultural center with trade networks and influence extending throughout the Lower Mississippi Valley. Baked clay balls known as "Poverty Point objects" are one of the important traits that mark the period. Other traits include an elaborate lapidary and microlithic industry, use of steatite vessels, and the use of exotic stone (Thomas 1982:5).

The Tchula Period (500 B.C. to A.D. 0)

Tchula period occupations in the Lower Mississippi Valley are associated with the Tchefuncte culture. The period has been called "the early ceramic period" because, with the exception of fiber-tempered pottery, it was the interval during which initial pottery complexes appeared in the Lower Mississippi Valley. Sites are few and scattered, and there are no universal markers. However, within subareas such as South Louisiana, regional markers, primarily Tchefuncte type ceramics, have been identified (Phillips 1970:7, 8, 15, 76).

Peoples of the Tchefuncte culture were the first to engage extensively in the manufacture of ceramics. Fiber-tempered and some grog-tempered or temperless sherds have been recovered from earlier Poverty Point contexts. These may represent primarily trade goods from the earliest pottery-making cultures to the east. The basic Tchefuncte ware is temperless or grog-tempered, with accidental inclusions of small quantities of sand and vegetable fiber. Sand-tempered wares represent a minority constituent of Tchefuncte site assemblages (Shenkel 1984:47-48).

The Marksville Period (A.D. 0 to A.D. 300)

The Marksville period is associated with a Hopewellian culture and tradition manifested throughout the Lower Mississippi Valley (Phillips 1970:7, 17-18, 886). The Hopewell culture's two major centers of development were in Ohio and Illinois, and date to between 200 B.C. and A.D. 400. Diffusion of aspects of the culture may have resulted from the activity of traders who established a wide-ranging network, sometimes termed the "Hopewellian Interaction Sphere." In addition to diagnostic pottery types of the Marksville period, conical burial mounds were characteristic of the culture. Interments are generally associated with grave goods. Some of these were manufactured from exotic raw materials (Neuman 1984:142-168).

The Baytown Period (A.D. 300 to A.D. 700)

The Baytown period has been defined as the interval between the end of Hopewellian/ Marksville culture and the emergence of Coles Creek culture. In the southern half of the Lower Mississippi Valley, there are no area-wide horizon or period markers (Phillips 1970:901). The Baytown period is often referred to as the "Troyville period" by Delta archeologists. Due to the lack of diagnostic markers for the period in southeastern Louisiana, it is often assimilated with the subsequent Coles Creek period, and the two are together referred to and discussed as "Troyville/ Coles Creek cultures" (e.g. Neuman 1984).

The Coles Creek Period (A.D. 700 to A.D. 1000)

The Coles Creek period is the interval that begins with the emergence of Coles Creek culture in the southern part of the Lower Mississippi Valley and ends with the establishment of "full-blown" Mississippian culture in the northern part of the Valley (Phillips 1970:18). Although it appears to represent a population zenith in the eastern delta province, many sites tentatively classified as Coles Creek may actually be from the Baytown period (Wiseman et al. 1981:3/5).

Coles Creek culture is characterized by small ceremonial centers with mounds. These were surrounded by villages of varying size. The culture developed in the area between the mouth of the Red River and the southern part of the Yazoo Basin. Its influence filtered into the delta region of southeastern Louisiana (Brown 1984:95). Mounds associated with the Coles Creek culture generally are larger and exhibit more construction stages than those associated with the earlier Marksville culture. A more significant difference is that Coles Creek mounds are pyramidal and flat-topped. They were used as substructures for religious and/or civic buildings. In contrast, Marksville peoples generally built conical burial mounds (Neuman 1984:167).

The Mississippi Period (A.D. 1000 to A.D. 1700)

The beginning of the Mississippi period is marked by the emergence of Mississippian culture in the northern part of the Lower Mississippi Valley and Plaquemine culture in the southern part (Phillips 1970:18-19). The Plaquemine culture itself is sometimes considered to be the classic development of temple mound construction in the lower portion of the Lower Mississippi Valley. However, archeological excavations suggest that it actually represents a late prehistoric development of the preceding Coles Creek culture. Multi-mound construction and artifact assemblages are evidence that link the two. Absence of European trade goods indicates that the Plaquemine culture reached its zenith prior to contact (Neuman 1984:258-259). Sites dated to the period of contact represent a Delta-Natchezan phase. Proportions of ceramic types change, some new styles and types appear, and European trade goods are often found in association with the aboriginal materials (Quimby 1957:118-119, 134-144).

Aboriginal Occupation during the Colonial Period

Identities and locations of Indian tribes in Louisiana cannot be determined for any period prior to about 1700. At about that time, literate French settlers and visitors began to record their observations regarding aboriginal occupants of the area. Even so, it remains difficult to sort pre- and post-contact culture traits. This is especially true for the lesser tribes living along the Mississippi River and other areas within southeastern Louisiana (Kniffen et al. 1987:45).

The protohistoric and early historic periods were traumatic for aboriginal society in southeastern Louisiana. The effects of disease and of the ever-increasing European population are reflected in the declining aboriginal population and in the migrations by remnants of various tribes. Internecine warfare typified relations between the various groups (Giardino 1984).

Documentary evidence indicates that different Native American groups resided in the vicinity of New Orleans at various times. A group of Ouma fled to the vicinity of the city following a 1706 attack on the tribe by the Tunica (Giardino 1984:248-249). Both the Ouacha and the Tchouacha were settled near enough to New Orleans to have had frequent contact with the European inhabitants. The Ouachas territory was located between the Mississippi River and Bayou Lafourche. As late as the early-nineteenth century, individuals who identified themselves as Ouacha were present in this vicinity (Pearson 1992). The Tchouachas were settled in the vicinity of English Turn in the early-eighteenth century. In 1758, a group of Tchouachas was living in the vicinity of New Orleans. They, as well as other remnant tribes moved throughout Orleans, Jefferson, and Plaquemines Parishes during at least the French Colonial period, frequently hunting for the Europeans (Giardino 1984:252).

The archeological record confirms material interchange between the colonists and Native Americans. Aboriginal ceramics have been recovered from eighteenth-century contexts at sites in and near New Orleans including the Hermann-Grima House site and the Chalmette Battlefield (Yakubik 1990). Investigations at the site of the 1730 military barracks on Toulouse Street in the Vieux Carré (Yakubik 1991), as well at the site of Bienville's concession on the west bank of the Mississippi River (16OR125) (Franks and Yakubik 1989) suggest that the settlers relied heavily on the use of aboriginal ceramics in the earliest years of the colony. The presence of Native American ceramics in the collection from the Cabildo (Yakubik and Franks 1997) indicates that aboriginal wares were utilized in New Orleans into the early-nineteenth century, suggesting that contacts with Native groups were also maintained until this date.

CHAPTER 4
HISTORIC OVERVIEW OF THE HOLLYGROVE AREA

Introduction

The proposed alignment for the Hollygrove area drainage improvements follows the right-of-way of Forshey St. westward from Carrollton Ave. to the former Illinois Central Railroad track embankment, which crosses Forshey St. approximately at the intersection of Forshey and Eagle streets, and then runs westward along the track alignment to the line of the Upper Protection Levee. In addition, the project improvements will incorporate Dublin St. from Belfast St. to Forshey St., and Eagle St. from the Illinois Central Railroad track to Stroelitz St. The proposed alignment incorporates portions of several historic features. The two major categories of features are: first, the former New Orleans, Jackson, and Great Northern Railroad (later Illinois Central) track right-of-way; and second, historic features including the Dublin drainage machine location, the Dublin Canal, and the Upperline Tail Race or Canal, which followed the line of the Jefferson and Lake Pontchartrain Railroad. These two categories of features are discussed separately below. Included in this chapter is a discussion of the development of the Hollygrove neighborhood.

Property Ownership

The project study area is located in an area that eventually became part of the city of Carrollton. It was, however, in the backswamp area behind the river frontage tracts originally granted during the French colonial period. Jean Baptiste le Moyne de Bienville received a huge concession from the French crown on March 27, 1719, which encompassed the area above the city of New Orleans as far as the Tchoupitoulas district, to a depth of forty arpents. Although the current project area was not part of the Bienville grants, being well beyond forty arpents from the river, it became tied to the river frontage of the future Carrollton during the eighteenth century. When Bienville returned to France on August 10, 1728, his land grant was annulled and the concession given to the tenants. A 1737 map shows the property owners who succeeded Bienville in 1728 (Cruzat 1927:372-373; cf. Schlesinger et al. 1989:14). The map indicates four settlers at the upper boundary of Bienville's lands. "M. de la Fernier," probably Nicholas Chauvin de la Freniere (or Lafreniere), became the proprietor of the land behind which most of the study area is located.

When M. de la Freniere died, the plantation passed on to his son, Nicholas Chauvin de la Freniere. There are two alternate accounts of what then became of the la Freniere plantation. One account states that la Freniere was executed for rebellion on October 25, 1769, and the title passed on to his brother-in-law, Louis Cesaire le Breton (Wadill 1925:266). William Williams (1876) proposed an alternate scenario, in which le Breton obtained a grant of land encompassing the former La Freniere tract from the French Governor on October 6, 1757. The official *Township Plats* of Jefferson Parish, showing le Breton's grant of 1757, clarifies this situation by showing that the back land containing the current project study area was granted separately on October 6, 1757, and leaving the possibility that the river frontage was obtained by le Breton in the succession of his brother-in-law. On February 15, 1764, Louis Cesaire le Breton also obtained a grant for the area between his 1757 grant and Lake Pontchartrain (*Township Plats*, Jefferson Parish).

Whatever the case, the land surrounding the current project area became le Breton's property. The land then passed into the hands of Barthelemy Macarty, but again there are two different explanations of how this occurred. The first proposes that Louis Cesaire le Breton died on June 10, 1776, and Macarty purchased the plantation from le Breton's succession on January (or June) 21, 1781 (Soniat 1937:208; Perilloux 1945:3). The second version states that the land passed into the hands of le Breton's son, Jean Baptiste Cesaire le Breton, who was murdered by slaves in 1771. According to this version, Barthelemy Macarty became the proprietor of the plantation upon Jean Baptiste's death and succession (Arthur and Kernion 1931:76).

Figure 2. Excerpt from Carlos Trudeau, *Plan of the City of New Orleans and Adjacent Plantations* (1798: redrawn by the WPA of Louisiana). The dotted lines indicate the modern alignments of Carrollton Avenue, Earhart Boulevard, and Tulane Avenue/Airline Highway (Louisiana Collection, Howard-Tilton Memorial Library, Tulane University, New Orleans).

The former le Breton plantation was being cultivated by Jean Baptiste Macarty at the end of the colonial period (Figure 2). However, there is evidently no surviving written record of how Macarty acquired the plantation. Jean Baptiste Macarty claimed that he had received a grant of the tract from the Spanish in 1795 as a reward for his services. The commission appointed to investigate land claims in the Eastern District of the Orleans Territory decided that Jean Baptiste's claim was invalid (Williams 1876:8-9). It was not until 1823 that Macarty's claim was retroactively legitimized by the U.S. Congress (U.S. Statutes at Large 1853:727).

Jean Baptiste Macarty died on November 10, 1808, and the succession divided his plantation among his three children: Barthelemy, Edmond, and Marie Celeste (wife of Paul Lanusse). Barthelemy and Paul Lanusse purchased Edmond's interest by act passed before Pierre Pedesclaux, Notary Public, on April 14, 1809. By another act passed before the same Notary Public, Barthelemy purchased the interests of Marie Celeste and Paul Lanusse on June 10, 1816 (Perilloux 1945:3).

On March 7, 1826, Barthelemy Macarty sold an undivided half of his plantation to Elenore Myrtile Macarty (wife of Charles Lanusse), by an act (No. 3431) passed before Notary Public Hughes Lavergne. The extensive Macarty holdings are depicted on the Ogden (1829) map (in Schlesinger et al. 1989:10). The Macarty tract fronted on the Mississippi River; the upperline was at the modern Upper Protection Levee, and the backline was in alignment with Northline Street

(now Northline Ave. in Metairie, which intersects the alignment of Palmetto St. about one block above Livingston St.). The lowerline of the Macarty tract was at modern Lowerline Street from the River to the alignment of Apricot Street (Walmsley Avenue). From modern Walmsley Avenue, the lowerline ran in the alignment of Pine St., not just to the alignment of the New Basin Canal (now the alignment of I-10) (Chase 1979:102-103) but beyond, to the vicinity of the modern intersection of Bienville and Pine streets. Barthelemy Macarty sold the second undivided half of his tract to Samuel Kohn and Bernard Marigny on April 30, 1831, by an act (No. 425) also passed before Notary Public Hughes Lavergne.

Marigny sold 4/5 of his interests in this large holding to Laurent Millaudon and 1/5 of his interests to John Slidell by an act (No. 864) passed before Notary Public Hughes Lavergne on September 2, 1831. This act made Millaudon 1/5 owner of the former Macarty tract and Slidell 1/20 owner of the plantation. Elenore Macarty's interests were conveyed to the New Orleans Canal and Banking Company (who constructed the New Basin Canal) on December 19, 1831; however, the notarial records of this transaction burned while in the custody of Hugh Maden about 1862 (Soniat 1937:208).

Thus, in 1832, one-half of the undivided interest in the former Macarty plantation was owned by the New Orleans Canal and Banking Co., one-quarter by Samuel Kohn, one-fifth by Laurent Millaudon, and one-twentieth by John Slidell. These co-owners formed a partnership and hired Charles Zimpel in 1833 to draw up a subdivision plan for the tract. Zimpel's plan encompassed the whole of the tract, including the swamp back lands, which were not settled, for the most part, for half a century or more. Carrollton Ave., the principal street of the area, was originally named Canal St. in honor of the New Basin Canal, while Carrollton Ave. was only the relatively short extension on the lake side of the New Basin Canal alignment. At the lowerline of the tract (now Lowerline St.), Nayades St. (now St. Charles Ave.) became First St. The numbered streets proceeded toward the lake, dividing double-lot squares measuring 650' on a side. Above 10th St. (temporarily Mobile, now S. Claiborne Ave.), these streets were: 11th (now Apple); 12th (now Apricot); 13th (now Fig); 14th (temporarily Macarty, now Oleander); 15th (now Olive); 16th (now Palm); 17th (now Washington and Palmetto); 18th (now Peach); 19th (now Pear); and 20th (now Quince). The original cross streets were: Canal (now Carrollton); Madison (now Dante); Jefferson (now Joliet); Monroe; Jackson (now General Ogden); Hamilton; Clay (now Cherry); and Livingston (Perilloux 1945:4).

The first subdivision lots in Carrollton were sold on May 1, 1833. While most early sales and development were concentrated toward the Mississippi River frontage of the area, one of the first sales was of lots #165 and #166, bounded by Jackson, 11th, 12th, and Monroe streets. Kohn, Millaudon, and Slidell together purchased several lots including this one; the cost was $129 cash, after a deduction from the sale price because of their one-half undivided interest in the entire property. With construction of the New Orleans and Carrollton Railroad, the nascent town began to grow. In 1845, Act 91 of the Louisiana Legislature incorporated the town of Carrollton, and by 1847, population had surpassed one thousand persons. The population of Carrollton grew steadily, if not dramatically, for the remainder of the antebellum period. A right-of-way through the back lands of the incorporated area of Carrollton was ceded to the New Orleans, Jackson and Great Northern Railroad on May 11, 1853 (Porter 1862:69), and is discussed in more detail in Chapter 5. On March 17, 1859, Carrollton officially became a city. On the eve of the Civil War, the population had reached 2,776 persons; of these, 237 were slaves, 99 were Free Persons of Color, and 11 were in jail (Perilloux 1945:3-6, 9, 69).

The Carrollton town council sought to regulate the subdivision as the area grew. In 1854, an ordinance required that the original double lots be divided into squares 300' on a side and with streets 50' wide, creating a relatively uniform grid over the entire incorporated area. Streets added running from the River (but not all to the rear corporation line) were: General Scott (now Cherokee), Millaudon, Hillary, Burdette, Short, Dublin, Cambronne, Leonidas, May, Holly-Grove,

Laurel-Grove, Live-Oak, Highland, Blackberry, and Philip. Streets added parallel to First St. were Hampson, Burthe, Zimple (*sic*), Plum, Jeannette, Green, Cohn, Cypress, Napoleon Ave. (now S. Claiborne Ave.), Nelson, Belfast, Pritchard, Colapissa, Forshey, Edinburgh, Stroelitz, Dixon, Marks, and Omega (now Heaton). However, well into the post-Civil War period, virtually the entire area above Carrollton Ave. to the lake side of modern Birch St. remained truck and dairy farms (Perrilloux 1945:4-5, 21).

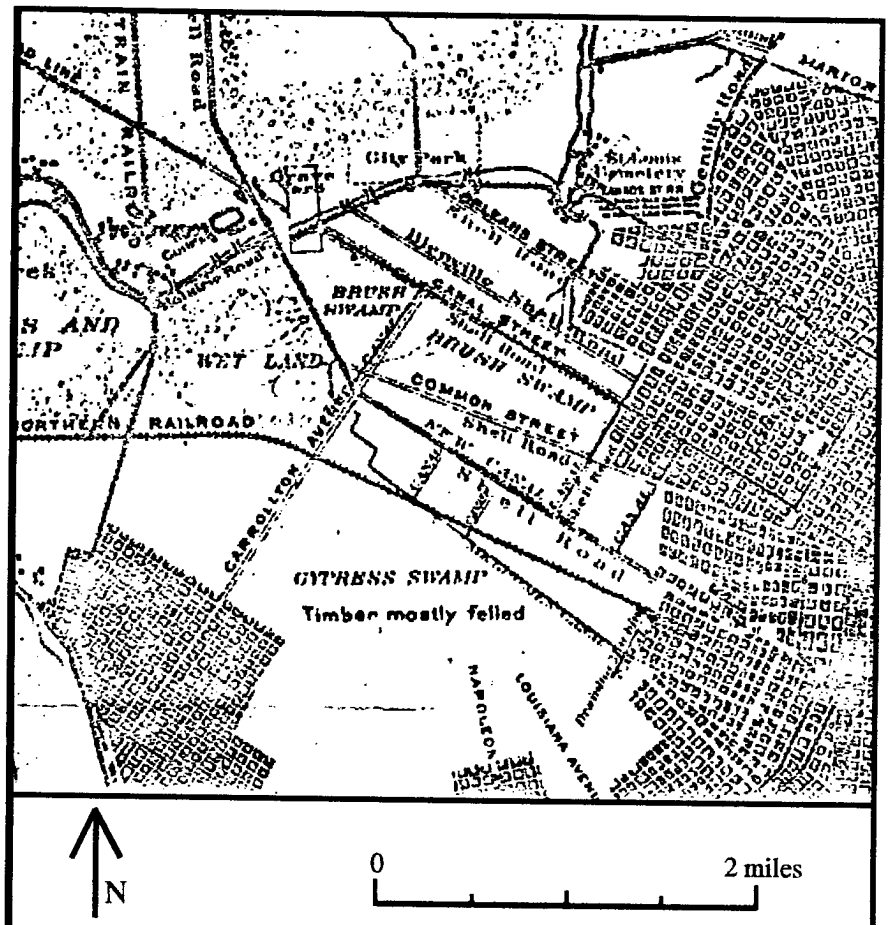


Figure 3. Excerpt from Henry L. Abbot, *Approaches to New Orleans* (1863), showing the Jefferson and Lake Pontchartrain R.R. and the New Orleans, Jackson, and Great Northern R.R. (The Historic New Orleans Collection).

The Jefferson and Lake Pontchartrain R.R., the Dublin Drainage Machine, the Dublin Canal, the Fourteenth St. Canal, and the Upperline Canal

The Jefferson and Lake Pontchartrain .R.R. had been chartered in 1851, and by January 1853 had completed a track from the N.O. and Carrollton Railroad depot (at modern St. Charles Ave. and Dublin St.) to Lake Pontchartrain (Figure 3). This track was embanked and may have been built on some kind of cribbing, which probably underlies the Upperline Protection (contemporary) levee that was later built (after 1871) on the earlier railway alignment. The rail line was out of service and the tracks removed by 1863.

Between 1858 and 1867 a series of drainage improvements were made in the back of Carrollton. These included the excavation of the 10th St. (Claiborne Ave.) Canal, the Dublin Canal, the Upperline Tail Race or Canal, and the 14th St. (Oleander St.) Canal. The 10th St. Canal ran from Dublin St. to Lowerline St., from which point it followed the alignment of modern Claiborne Ave. through the then-vacant back land behind modern Willow St., connecting to the Claiborne Canal. The Dublin Canal ran from 10th St. to the Shell Road on the river side of the New Basin (or New Orleans) Canal (later Pontchartrain Blvd. and the alignment of the I-10), but did not flow into the New Basin Canal. The Dublin Canal, about 40' wide, was excavated on the downriver side of the Dublin S. right of way, and a levee was constructed with the Dublin Canal dredgings, on its downriver side, actually within the squares between Dublin and Dante streets. The J. & L.P. R.R. embankment formed the basis of the Upperline levee, and the ditch that paralleled the railroad embankment on its lower side was enlarged from Lake Pontchartrain to Fourteenth St. (now Oleander St.), forming the Upperline Tail Race or Canal. The 14th St. Canal ran from Dublin St. to the Upperline Canal. During this period before 1871, a "drainage machine" was constructed at Fourteenth St. and Dublin St. The machine building was a wood-frame structure straddling 14th St. on the upriver side of a roughly triangular intake basin adjacent to the

right of way of Dublin St. The "machine" con-sisted of two paddle wheels, which lifted the water from the intake basin to the 14th St. Canal, powered by steam engines. These paddlewheels had a total capacity of 490 cubic feet per second against a five-foot lift. For over a quarter of a century this drainage machine was the principal drainage feature of the Carrollton area (Figures 4 and 5). Carrollton Ave., meanwhile, was an open canal between the New Basin Canal (which it intersected but with which it did not connect), and the Orleans Tail Race Canal. After the 1870s, the system of drainage was altered by the construction of the 17th St. Canal between 1878 and 1896 (Maygarden et al. 1996; d'Hemecourt 1874; Williams 1876:26; Sulakowski 1873; Hardee 1878; MRC 1896).

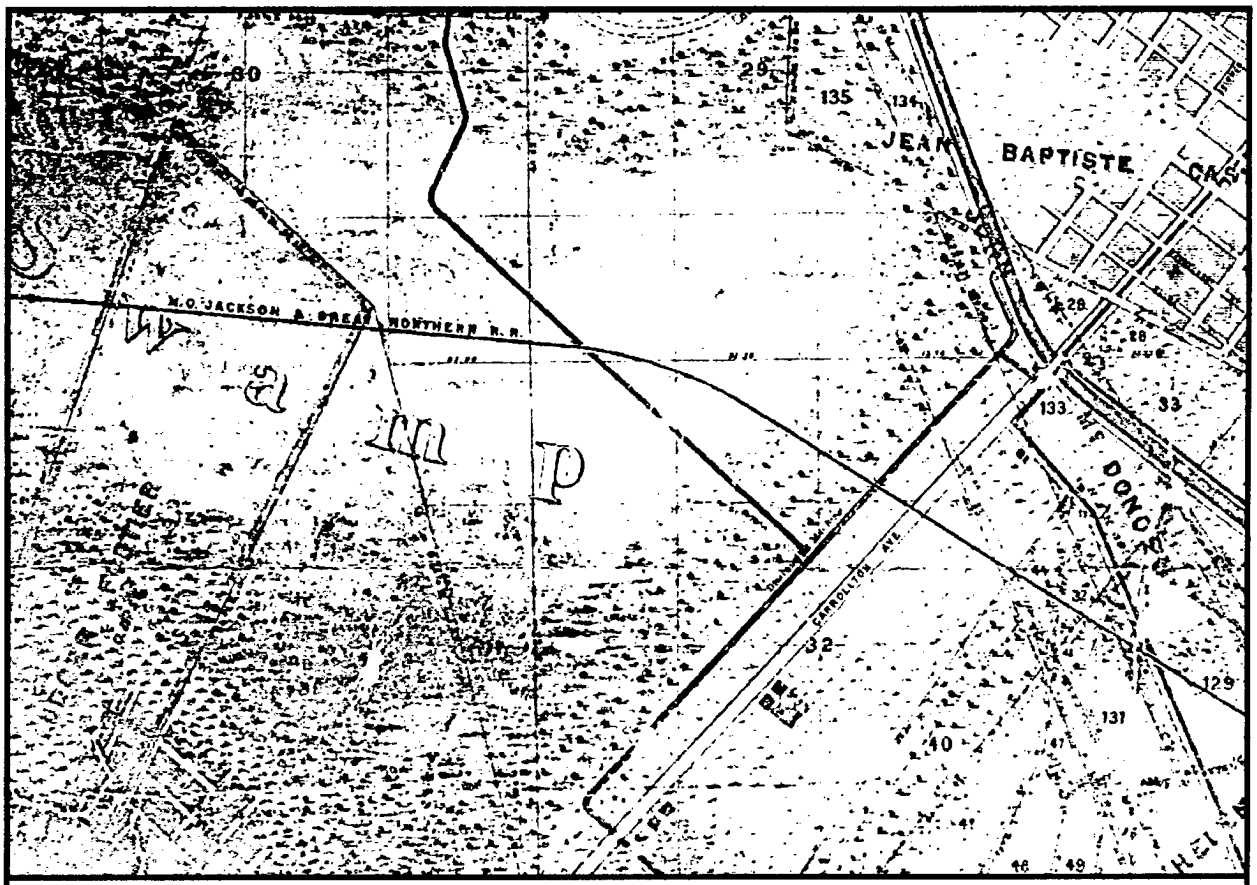


Figure 4. Excerpt from Valery Sulakowski's 1873 *Official Map of T.12 & 13 S. R11E., South Eastern District of Louisiana, East of the Mississippi River, Comprising the Cities of New Orleans and Carrollton, with all the Lands extending to the Lake Pontchartrain* (The Historic New Orleans Collection, New Orleans).

The 1896 Mississippi River Commission chart (MRC 1896) showing the current project area (Figure 6) was actually drawn from surveys done several years before, and indicates some of the effects of the 1870s drainage modifications, which were quickly noticeable. The area between the 14th St. Canal and the Claiborne Canal was more thoroughly drained, and writing in 1876, William Williams stated the "area once covered with standing water is now fitted for cultivation; the lands are rich and productive, and in many localities are already covered with fields and gardens" (Williams 1876:26). Most of the area on the lake side of the outbound I.C.R.R. track and the 14th St. Canal remained swampy, although the 17th St. Canal drained a corridor paralleling the 14th St. Canal and the New Basin Canal. Downriver from Carrollton Ave., the 17th St. Canal followed the alignment of modern Washington Ave. Above Carrollton Ave., the 17th St. Canal followed the

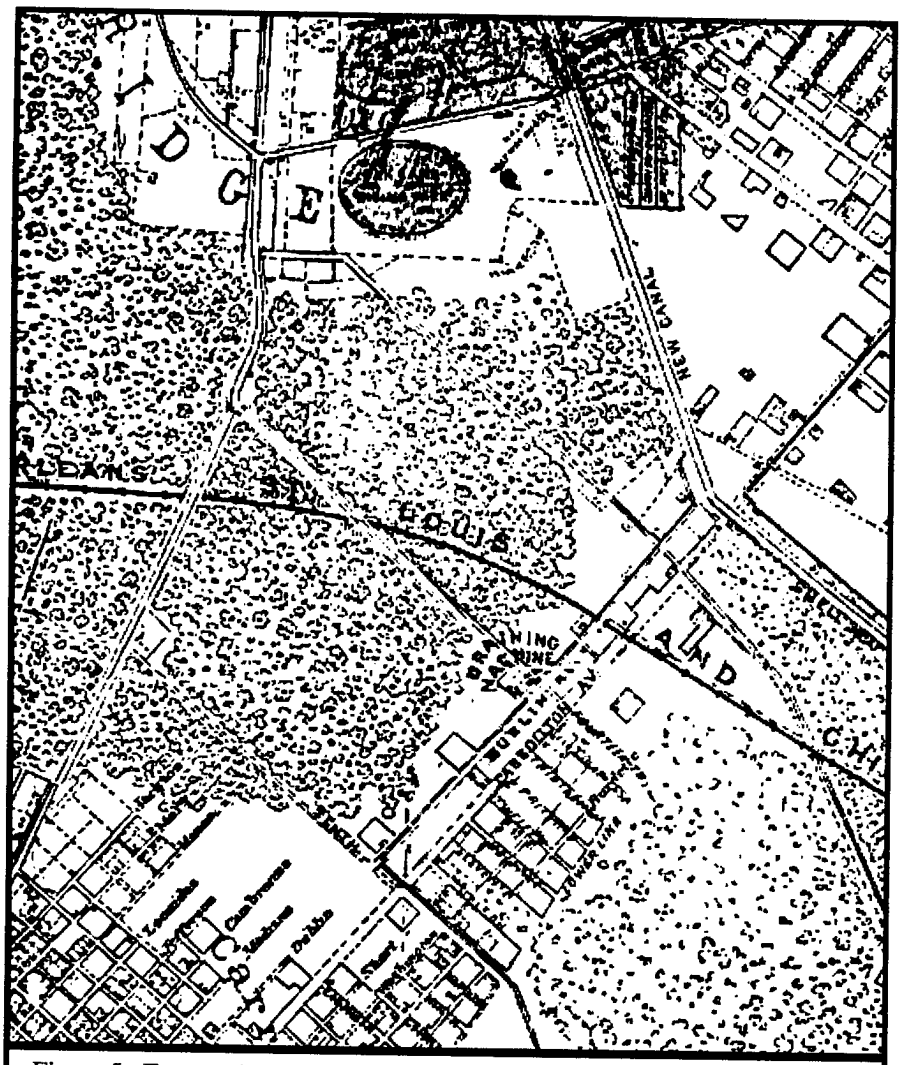


Figure 5. Excerpt for T.S. Hardee, *Topographical and Drainage Map of New Orleans and Surroundings* (1878) (The Historic New Orleans Collection, New Orleans).

alignment of Palmetto St. to Northline Ave., the upper limit of Carrollton, where it took a turn nearly due west to the Upperline Canal.

Following the 1895 Drainage Plan, which inaugurated modern drainage in the City of New Orleans, the enlarged 17th St. Canal (the first drainage network construction project after adoption of the 1895 Plan) became the feeder into Drainage Pumping Station No. 6 and the Metairie Relief Outfall Canal, as the Tail Race was renamed on the lake side of Station No. 6. The flow of the Oleander St. Canal (formerly Fourteenth St.) was intended to be reversed toward Dublin St., but this apparently was not immediately done. The area bounded by the open canals on 10th St. (S. Claiborne Ave.), Dublin St., 14th St. (Oleander St.), 17th St. (Palmetto St.) and Upperline St. was called "the Island" by Carrollton residents. About 1898, the Dublin drainage machine was dismantled, and the intake basin was probably infilled soon after. The 14th St. Canal was sealed at its juncture with the Upperline Tail Race Canal, and the Tail Race Canal between 17th St. and 14th St. went out of use. By 1916, the Claiborne Ave. Canal was extended to the Upperline Protection Levee and the Upperline Canal extended toward the River to join the Claiborne Ave. Canal. There was no road bridge constructed over the Upperline Canal at Claiborne Ave. for many years. In 1921, the Dublin St. Canal was reworked as a pipeline. By 1945, all of the open canals in the area had been covered, with the exception of the Upperline Canal and the Seventeenth St. Canal. Oleander St. evidently remained infilled until, before 1954, the Oleander St. Canal was constructed, flowing toward the Upperline Canal from Monroe St. (Maygarden 1996:72-75; Perilloux 1945:66).

The Hollygrove Neighborhood

What is now generally referred to as the Hollygrove neighborhood is actually the rear of Carrollton, and was very sparsely developed before the period of modern drainage. The Zimpel map (1834) shows the Hollygrove area subdivided, anticipating its actual development by over 30

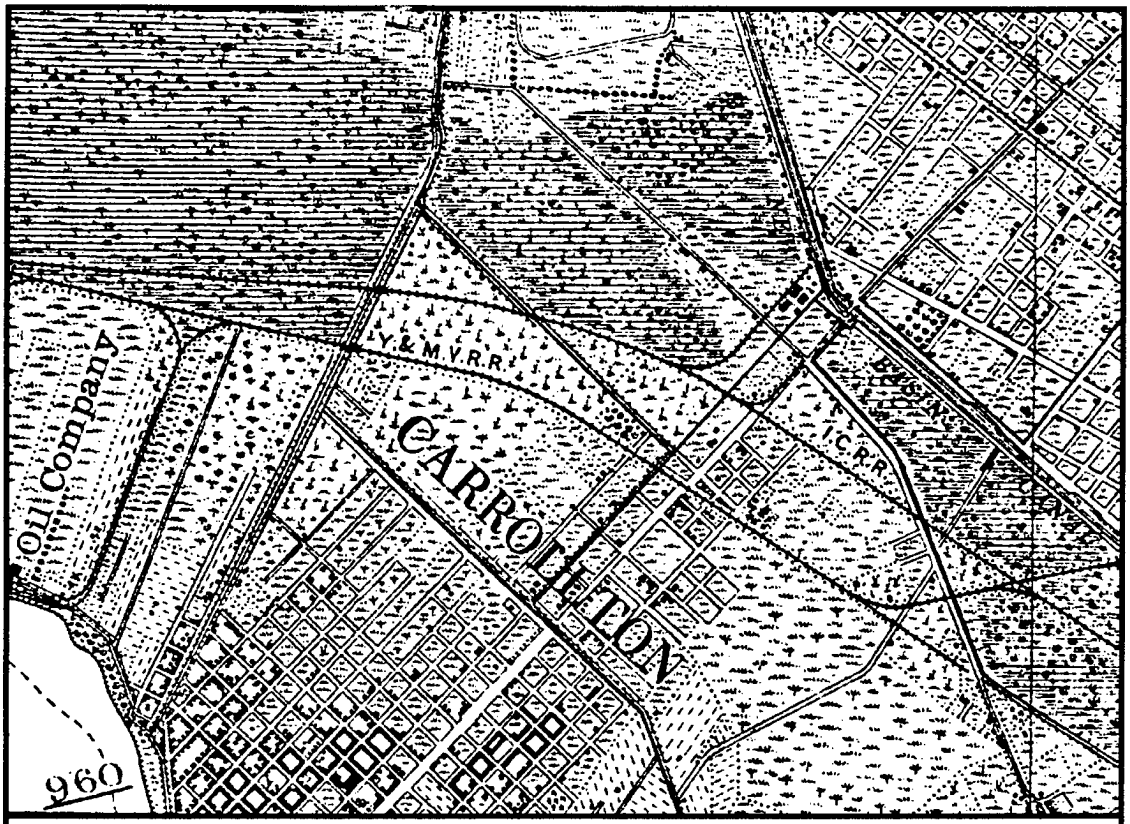


Figure 6. Excerpt from Mississippi River Commission Chart No. 68 (1896), showing the Hollygrove area (Louisiana Collection, Howad-Tilton Memorial Library, Tulane University, New Orleans).

years. As mentioned above, the vast majority of what became Hollygrove remained livestock farms for decades after Carrollton was incorporated. However, the presence of the N.O.J. & G.N.R.R. after 1854 may have stimulated some development in proximity to the track where drainage was good enough. According to Hollygrove native Joseph Macaluso, two brick structures in proximity to the embankment were used for ammunition storage during the Civil War. One was located on Colapissa St. between Leonidas and Joliet streets, and another on the square bounded by Eagle, Colapissa, Monroe, and Oleander streets, where an electrical substation is now located. They may have been brick dairy buildings or some other farm structures. Macaluso helped demolish these structures and reuse antebellum bricks in new construction of a house in the neighborhood, at the corner of Live Oak and Pritchard streets (Joseph Macaluso, personal communication 1999). It is possible that some sort of siding was built in the area during the antebellum period, but there are no buildings or sidings shown on the Abbot Map (1863) or post-Civil War maps by Sulakowski (1873) or Hardee (1878). The Sulakowski map (1873) shows no development at all west of the Dublin Canal, while Hardee (1878) shows only a handful of lots on either side of Dublin St. Carrollton was annexed by New Orleans on March 23, 1874, and the Seventh Municipal District, consisting of the Sixteenth and Seventeenth wards, was created in 1882. As late as the mid-1880s, almost all of the Seventeenth Ward, which included the project area, was characterized as "thinly settled and mainly given up to dairies, small truck farms, etc." (New Orleans Press 1885:4). The population of Carrollton in 1896 was 12,000 persons, the vast majority of whom lived below 10th St. (S. Claiborne Ave.) (Perilloux 1945:69).

As shown by the 1896 MRC map (Figure 6), by the 1890s a large facility was already located on a spur of the I.C.R.R. at Dublin St. and the New Basin Canal. Another spur extended

along the alignment of Carrollton Ave., but apparently stopped at the 17th St. Canal. These spurs likely served the yards of the Gulf Lumber Co. Ltd. and McEwen and Murray Ltd. Other development was depicted along Dante St. between the 10th St. Canal (S. Claiborne Ave.) and the 14th St. Canal (Oleander St.). However, no development was shown above the alignment of Cambronne St. (not yet laid out) with the exception of a series of small structures along the 17th St. Canal and a small area bounded by modern Claiborne Ave., Hamilton St. Belfast St., and the Upperline Canal (MRC 1896; N.O. City Directory 1896).

The boundaries of Hollygrove were never formally established, but residents generally considered the area bounded by the Upperline Canal; South Claiborne Ave; Carrollton Ave.; and on the lake side, either the New Orleans (New Basin) Canal and Northline St., or the 17th Street (Palmetto) Canal. Areas to the lake side of the L.R.& N.R.R. (later L. & A.R.R.) tracks (ca. 1900) and Airline Highway (ca. 1930), but within Orleans Parish, were not generally considered part of Hollygrove, at least after Airline Highway was built (Joseph Macaluso, Joriceen Carter, and Corinne Joseph, personal communication 1999). The Hollygrove neighborhood's development was affected by the presence of the three railroad tracks that transected it, but the two of the Illinois Central were not considered the sort of psychological barrier to neighborhood definition that the Louisiana and Arkansas tracks seemed to be. The construction of Airline Highway ca. 1930 reinforced this notion of the boundary at the L. & A.R.R. tracks. Since all three of these rail alignments were embankments, they prevented most of the streets in the neighborhood from crossing the tracks. Nevertheless, the Hollygrove area had major transportation corridors on three sides, and the neighborhood between the Upperline Canal, Palmetto St., S. Carrollton Ave., and S. Claiborne Ave. had developed by the end of the 1950s as an area of modest owner-occupied homes and relatively well-maintained duplex and four-plex apartments, with a number of neighborhood businesses.

As mentioned above, the 1896 Mississippi River Commission map (Figure 6) shows the very limited development in the future Hollygrove area at the end of the nineteenth century. Only a handful of buildings are shown along Claiborne Ave., S. Carrollton Ave., Dublin St., Dante St., and on the Shell Rd. along the New Basin Canal. Neither the inbound nor outbound Illinois Central R.R. tracks had any development along them within the future Hollygrove area except at Carrollton Ave. and on spurs near the New Basin Canal. The Seventeenth St. Canal was reconstructed beginning in 1896, and the Dublin Canal was reconstructed ca. 1896-1897, in accordance with the 1895 Drainage Plan for New Orleans (Maygarden 1996:72-75). These improvements helped drainage in the area, but development did not cover the whole area simultaneously. Besides the major lumberyards near the New Basin Canal, an early landmark in the future Hollygrove area was the Louisiana Arena. This was a sports venue where many prize-fights were held, located at Palm St. and Carrollton Ave., in the square where the A. & P. store (3612 S. Carrollton Ave.) is currently located. The Louisiana Arena flourished in the period 1910-1915 and was demolished by 1929 (Perilloux 1945:31-41; Joseph Macaluso, personal communication 1999).

Aside from houses on Carrollton Ave., one of the oldest houses in central Hollygrove is at 3300 Joliet St., which pre-dates 1915. By the 1920s, development in the Hollygrove area had definitely accelerated, with homes in the area constructed by Macaluso Construction Co., founded by Joseph Macaluso Sr. in 1915. The population growth of the area resulted in the construction of churches and schools to serve the neighborhood. The first churches in the Hollygrove area reflected the heavily Catholic population of Carrollton, including many persons of Italian, Irish, German, and French descent. Incarnate Word Catholic Church (8326 Apricot St.) was established as a mission chapel of Carrollton's Mater Dolorosa Church in 1918. The Incarnate Word parish was created in 1922; it established a mission chapel at Palmetto and Leonidas streets, which became the parish church of St. Theresa the Little Flower of Jesus in 1929. Lafayette School (originally for white students), at 2727 S. Carrollton Ave., was built in 1923. Prior to construction of Lafayette School, the white children of Hollygrove had to attend Walter C. Flower School at Leonidas and Green streets (later the site of Alfred C. Priestley School). In addition, in 1923,

Incarnate Word Catholic School opened. Another Hollygrove landmark, the Waldo Burton Memorial Home, was constructed in 1921 for the Society for the Relief of Destitute Orphan Boys. Two squares behind the home were used for decades for recreation by the boys, and as gardens where they grew much of their own food. Across Carrollton Ave., the massive Notre Dame Seminary was completed in 1923 (Perilloux 1945:31-41; Joseph Macaluso, personal communication 1999).

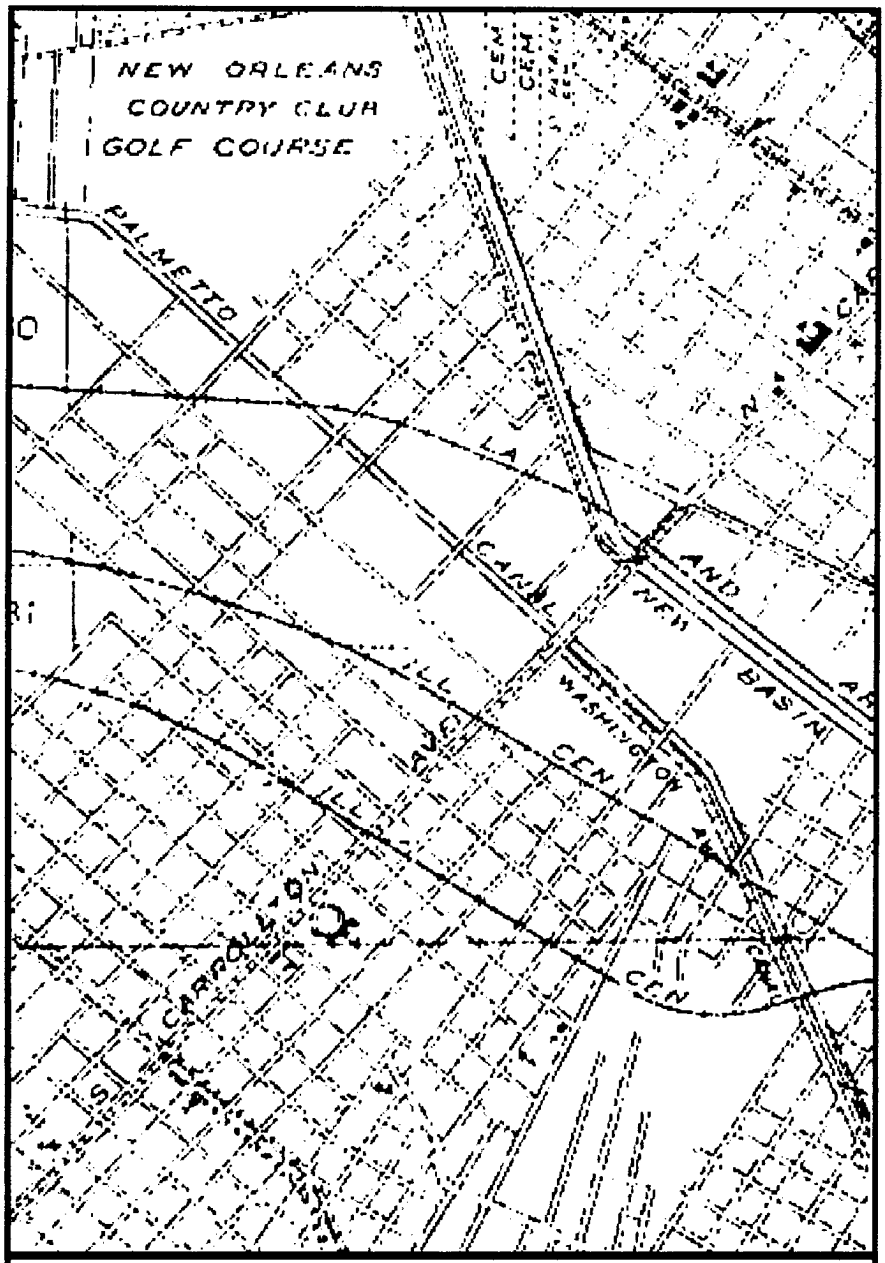


Figure 7. Excerpt from the *New Orleans East* (1932) 7.5' quadrangle map showing extension of streets in the Hollygrove area.

The 1929 Sanborn Fire Insurance Map Co. (Sanborn 1929) survey of the area still showed limited development in the Hollygrove area, particularly above or on the lake side of General Ogden St. Several of the streets in the area were not open where they crossed the I.C.R.R. alignment, and Dublin St. was labeled "impassable" at the point where it intersected Oleander St. This was the location of the old intake basin for the Dublin St. Drainage Machine, which probably was unstable after filling. The crossing of the outbound I.C.R.R. track at Monroe St. was constructed about 1929, and within a few years, bus service was instituted on Leonidas and Monroe streets. For decades, the only street crossings of the outbound embankment were at Monroe and Eagle streets. When the 1932 U.S.G.S quadrangle map (U.S.G.S. 1932) (Figure 7) was prepared, there was no development shown on the river side of the Illinois Central track above Hollygrove St., and still none above General Ogden on the lake side of the tracks. The 1932 quad suggests that streets crossed the outbound track embankment at Oleander, Monroe, Eagle, and Fig streets. This is in contradiction to the 1929 and 1949 Sanborn maps, which show Monroe, Eagle, Gen. Ogden and Hamilton streets open, but show Oleander and Fig streets not opened across the embankment. Meanwhile, a map by the New Orleans Planning and Zoning Commission indicated no "development" above Joliet St. between Claiborne

Ave. and Fig St., and none above Dante on the lake side of Fig Street had occurred by 1930 (N.O. Planning and Zoning Comm. n.d.). This contradicts the evidence of the 1929 Sanborn maps, which show limited or spotty development above or west of those streets. The 1930 U.S. census revealed some interesting facts about the Hollygrove area. The most densely populated portion of the neighborhood was its lower river side portion. Next was the area between Cambronne St. and Carrollton Ave. from Forshey St. to Palmetto St. Above Monroe St. to the Parish line and on the river side of Belfast St., population density was low. All areas of Hollygrove grew significantly between 1910 and 1930, but the upper portions grew most, doubling or more than doubling their populations between 1910 and 1920, and then again between 1920 and 1930. The upper and riverside portions of Hollygrove grew most rapidly in the 1920s, more than tripling their populations between 1920 and 1930.

Earlier residents had been predominantly white in the area on the lake aside of the I.C.R.R. tracks, called the "Devil's Elbow" by neighborhood residents. The area's residents had a reputation for toughness. As more people settled in the area above Gen. Ogden Street, this part of Hollygrove's population became substantially African-American. The further toward the Jefferson Parish line and the Palmetto Canal, the greater the proportion of African-Americans in the population, and the closer to Claiborne Ave. and Carrollton Ave., the greater the proportion of white European-Americans. In 1929, Paul E. Dunbar School ("colored") at 9930 Forshey St. was constructed. Racial animosities were certainly present in the pre-World War II era in the Hollygrove area, but may have been less virulent than later; children and teen-agers all knew each other and played sports together, despite official segregation at school and elsewhere. The socioeconomic status of Hollygrove residents also largely followed the geographic racial distribution, with the highest income groups concentrating in proximity to Carrollton Ave. and middle class-residents predominating closer to Claiborne and Carrollton avenues (Gilmore 1937; Joseph Macaluso, personal communication 1999). A marker of growing diversification in Hollygrove during the 1930s was the establishment of a remarkable number of protestant churches to serve non-Catholics, many of them small churches with predominantly African-American congregations. These included (by 1938): Nazareth Baptist Church (9126 Apricot St.), St. John Evangelical Church (8439 Belfast St.), St. Peter A.M.E. Church (3424 Eagle St.), Friendship Baptist Church (3125 Hollygrove St.), Tabernacle Baptist Church (8915 Palm St.), Nazareth Baptist Church (9108 Pritchard St.), Mt. Rock Baptist Church (9108 Pritchard St.), and to the lake side of the edge of Hollygrove, the Second Hollygrove Baptist Church (9022 Dixon St.).

Drainage improvements during the 1930s allowed development to extend into portions of Section 30 and Section 31 that had previously been vacant. These improvements included the construction in 1937 of subsurface drainage features on Hamilton, Hollygrove, Mistletoe, and Nelson streets (Maygarden 1996:75), which helped flooding problems somewhat. However, utilities did not cross the embankment or extend into undeveloped squares, which continued to influence post-World War II development in the neighborhood. As several streets (e.g., Fig, Colapissa, Oleander, and Forshey) were extended from Eagle St. toward the parish line, an underlayment of incinerated garbage was dumped as fill beneath the streets (Joseph Macaluso, personal communication 1999). The 1939 U.S.G.S. quadrangle map for the area (Figure 8), compared to the quad edition of 1932, shows the extension of streets during the 1930s.

The Illinois Central tracks were an important aspect of life in the Hollygrove area for both businesses in proximity to them but also for people residing in Carrollton generally. Two I.C.R.R. passenger platforms were located on S. Carrollton Ave. The platform on the incoming track was located on the downriver side of Carrollton Avenue at Earhart Blvd., occupying what is now the downriver carriageway of Earhart Expressway (on the lake side of the Walgreen's store at 3033 S. Carrollton Ave.). The outgoing track passenger platform was on the square above the current post office (at 3400 S. Carrollton Ave.) on the upriver side of Carrollton Ave. The roofed platforms were several hundred feet long and were in use until about 1954. The mainline tracks in the Hollygrove area were very active; among numerous freight and passenger trains, the famous

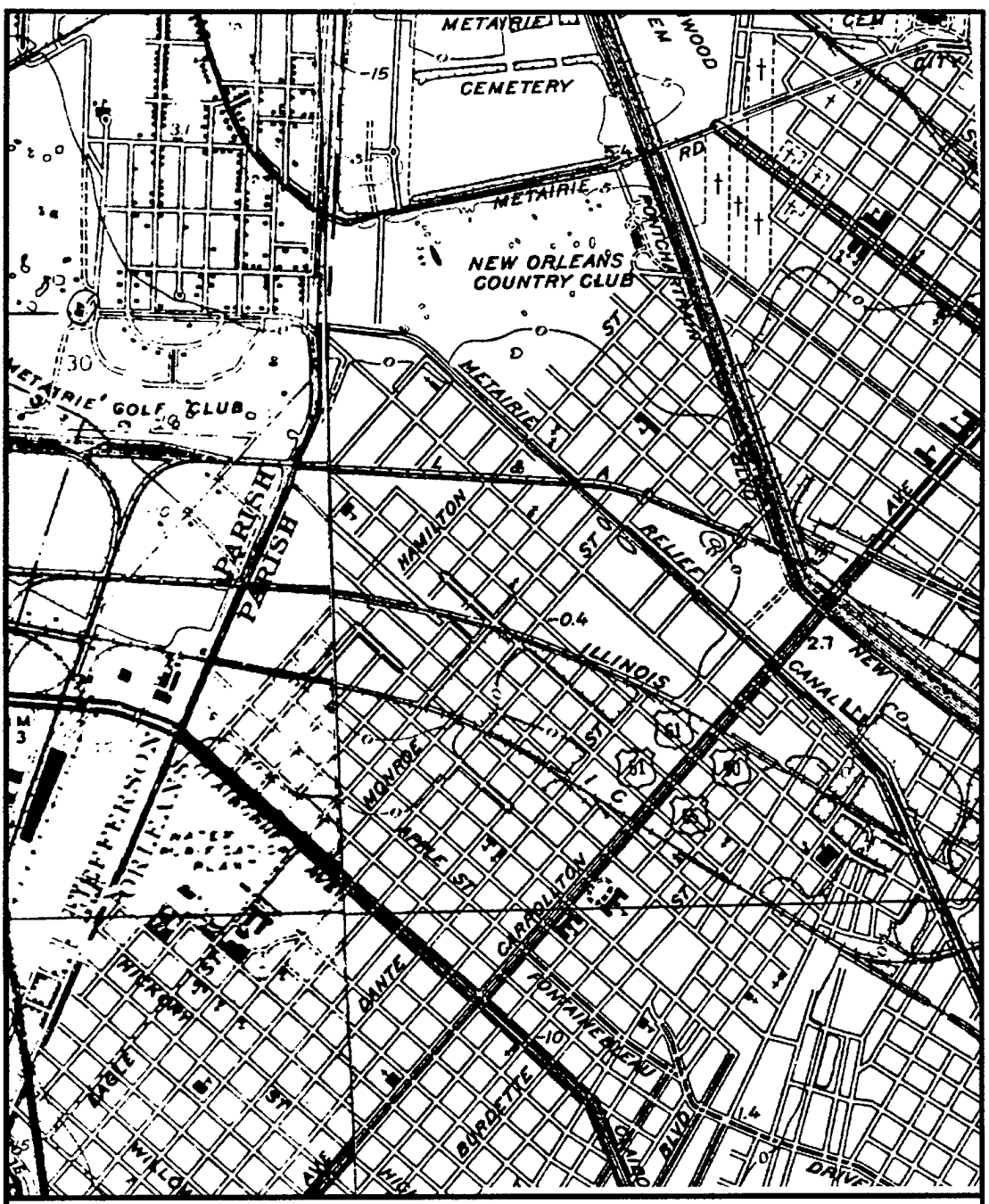


Figure 8. Excerpts from *New Orleans East* (1939) and *New Orleans West* (1938) 7.5' quadrangle maps showing extension of streets in the Hollygrove area.

Panama Limited "streamliner" came into New Orleans in the morning and left in afternoon through the Hollygrove neighborhood. The section house, where the I.C.R.R. section gang workers stayed, was near the inbound tracks, at Leonidas St. and Earhart Boulevard. This section house was where the Nola Box Co. is currently located (8501 Earhart). The section boss resided in a company-owned house at Joliet and Colapissa streets. Hollygrove residents saw the section gangs at work on the tracks "all the time," performing their thorough maintenance regimen under the command of the section boss, and singing their distinctive railroad work songs (see Chapter 5).

The I.C.R.R. tracks provided a pedestrian shortcut between parts of the Hollygrove neighborhood and thoroughfares or public transit routes. Joseph Macaluso remembers walking the tracks to and from high school. From the Macaluso family home at 2924 Monroe St., Joseph Jr. would walk up Monroe, get on the I.C.R.R. embankment at Monroe and Forshey St., walk down the tracks (against the direction of oncoming trains) to Broad St., and then out Broad to Samuel J. Peters Boys High School of Commerce (now the location of St. Augustine Catholic High School). Walking home, Macaluso would walk up Broad from Tulane to the incoming I.C.R.R. tracks (Earhart Blvd.), and up the tracks to the intersection of Monroe St. and Earhart (Joseph Macaluso, personal communication 1999).

In the pre-interstate trucking era, businesses requiring access to transportation clustered around railroad tracks and sidings. Among the few large commercial or industrial enterprises located in Hollygrove to the lake side of the I.C.R.R. tracks was the Cloverland Dairy Products plant at Olive and Dublin streets. The plant obtained milk from surrounding dairies, which seemed to be holdouts of old Creole agrarian culture. The Hypolite Charalou cattle farm remained until the World War II era between the two sets of Illinois Central R.R. tracks, General Ogden St., and the Parish line. The Original Standard Dairy was at 2500 Joliet St., and other cattle farms were located at the northern edge of Hollygrove in the late 1930s, including the Savain Bordes Dairy (8433 Palmetto St.), and the William J. Lacrouts Dairy (8513 Palmetto St.). The Cloverland Dairy also had an ice-cream parlor open to the public. The large milk bottle-shaped water tower at the Cloverland plant, near the I.C.R.R. outbound platform at Carrollton Ave., was a long-time Carrollton landmark. The facade of the Cloverland Dairy was incorporated into the Carrollton Post Office (Joseph Macaluso, personal communication 1999; New Orleans City Directories).

On the river side of the inbound I.C.R.R. tracks was the Marine Paint and Varnish Co. at the corner of Fig and Dante streets (8301 Fig St.). The large early-twentieth century brick industrial structure used by this company still stands, adapted for re-use by a variety of businesses. During the 1930s, much of the Hollygrove area remained sparsely developed, and the low density of development allowed businesses that required expanses of open space. These land-uses included industrial and materials yards, such as the Iron and Steel Products Co. at Edinburgh St. and So. Carrollton Ave. or the American Products Manufacturing Co. chemical plant (8131-8133 Oleander St.) and the Peet Milano Ice plant (8200 Oleander St.), adjacent to the outbound I.C.R.R. tracks. The Architectural Stone and Plastering Co. yard was located on the river side of the inbound I.C.R.R. track at 8122 Colapissa St. and the Melde Tile Roofing Co. at 3215 Dublin St. Several lumber yards bordered the Hollygrove area, having located near navigable canals and rail lines. Backed against the inbound I.C.R.R. track and fronting on Fig St. after ca. 1935 was Carrollton Lumber and Wrecking Co. (currently still in business at 2938 Leonidas St.).

Even before the railroad shaped the evolution of the Hollygrove area, the New Basin Canal had determined locations of businesses, which remained active through the World War II era. In the northern reaches of modern Hollygrove, the New Basin Canal was crossed by a drawbridge at Carrollton Ave. near where the Carrollton Ave. underpass is currently located. The L. & A.R.R. tracks crossed the canal on a bridge slightly above Dublin St. until development of the Pontchartrain Expressway in the 1950s totally altered the landscape in this area. In the 1930s, the large John C. Ragan Export Lumber Co. was bounded by Carrollton Ave., the Parish line, the New Basin Canal, the L. & A.R.R. tracks, and the outbound I.C.R.R. track (office, 3212 Dublin St.). On the other side of Carrollton Ave. opposite the Ragan yard were two other yards, Salmen and the Jahncke materials yard (Joseph Macaluso, personal communication 1999; N.O. City Directories).

Like in many New Orleans neighborhoods, local stores provided Hollygrove residents with their principal source of consumer products. S. Carrollton Ave. and Claiborne Ave. were not nearly the commercial thoroughfares in the 1930s that they would become later, in the automotive era, and in this period, Oak Street in Carrollton remained a major shopping attraction. In

Hollygrove, the largest number of businesses were grocery stores. In an area approximately one mile square, no fewer than 20 groceries or meat markets were in operation in the late-1930s:

Table 1. Grocery Stores in Hollygrove, 1938 (from N.O. Directory, 1938).

George F. Freitag	9000 Apricot	corner Hollygrove	grocery
Frank Radosta	9002 Apricot		meats
Felix Lamor	8301 Belfast	corner Dante	grocery
John C. Feldman	8824 Belfast		grocery
Joseph A. Durand	2424 Cambronne	corner Nelson	grocery
Cali Grocery	2941 Eagle		grocery
Oscar Perry	3520 Eagle		grocery
Henry H. Johnson	3001 Eagle		grocery
Vincent Randazzo	8840 Edinburgh		grocery
King Bros.	8800 Edinburgh		gro. and meats
Philip Perino	8641 Forshey	corner Monroe	gro. and meats
Joseph Terranova	9013 Forshey		gro. and meats
Leon Blanda	2820 Joliet	corner Pritchard	grocery
John J. Amato	8301 Nelson		grocery
Frank Trudeau	8318 Nelson		meats
Arthur P. Vivien	8300 Oleander	corner Dublin	meats
Mrs. Ferol Stokes	8438 Oleander	corner Joliet	grocery
Joseph Giacobbe	8737 Olive		grocery
Salvadore Vintarella	8841 Olive	corner Gen. Ogden	gro. and meats
Louis Nuccio	9001 Olive		grocery

In addition to these grocery stores, there was in 1938 one bakery (Alfonse J. McCarron, 3317-3319 Monroe); and, suggesting that Man cannot live by bread alone, two package liquor stores (Joseph Milano, 8639 Oleander; Louis J. Klein, 8800 Olive), as well as the Golden Valley Beer Parlor (8801 Edinburgh), one of the only neighborhood bars present in the 1930s besides the one in the College Inn restaurant (3016 S. Carrollton Ave). Other consumer products were available to Hollygrove residents at; Michel's Pharmacy (8900 Forshey), Joseph J. Romano Drug Store (8701 Pritchard); and the H.G. Hill Stores (8241 Apricot). Gasoline and automobile repairs were available at Nick's Service Station (8734 Palm) and the Leonidas Service Station (2538 Leonidas). The Marie Scorsone Beauty Parlor (3000 Monroe) and the Dublin School of Music (2608 Dublin) served other consumer demands. Army veterans of the Spanish -American War and World War I met at the New Orleans All-Army V.F.W. Post No. 3687 at 3800 Monroe St. while navy veterans met at the Cruiser *New Orleans* V.F.W. Post No. 2783 at 3831 Monroe St. (New Orleans Directory 1938).

For several decades, the availability of green space was greater in Hollygrove than in many other, older residential areas of the city. Dispersed housing allowed residents on some lots to raise chickens, and even goats, pigs, and cows. Undeveloped space also allowed several ballparks and baseball fields to be located in the Hollygrove area at various times. These included a field on the lake side of the Cloverland Dairy, now the site of a portion of Carrollton Shopping Center; on the river side of the Illinois Central R.R. tracks (now Earhart Blvd.) where the Carrollton Lumber and Wrecking Co. has been located since the late-1930s (2938 Leonidas St.). Another ballpark was located on the square bounded by Live Oak, Fig, and Cherry St., now part of the grounds of Dunbar School. The largest ballpark in the Carrollton area is of course the New Orleans Recreational Department Municipal Ball Park, which has large covered bleachers. It was built immediately before World War II, and on Sunday afternoons, keenly competitive local teams played while some of the spectators enthusiastically wagered money on the outcome of the games. A couple of bars

sprung up adjacent to the park to cater to thirsty baseball fans after the stadium was constructed. Other small ball fields were located at Hollygrove and Hamilton streets and Apple and Nelson streets.

The well-remembered Pelican Stadium (1938-1957) was originally Heineman Park (1915-1938) and was located outside of Hollygrove at the intersection of Tulane and Carrollton avenues, but Hollygrove sports fans wore a beaten footpath from their homes to and from the ballpark. Joseph Macaluso, a student at "Commerce High School" (which drew from the Hollygrove area), and his schoolmates would attend the ballpark when school let out: they would walk from Broad St. to the park, arriving just in time to be admitted free after the sixth inning. When the games were finished, the students walked across green fields from Heineman Park to their homes. Sports fans from all over Carrollton and the uptown area converged on Hollygrove when LSU played home football games; the Illinois Central passenger platform at Carrollton Avenue and Edinburgh St. was crammed with passengers catching trains to Baton Rouge. When Tulane played LSU in Baton Rouge, four or five trains would leave New Orleans for the Saturday afternoon events. The Illinois Central tracks ran within blocks of Tiger Stadium (Joseph Macaluso, personal communication 1999; New Orleans City Directories 1920-1940).

After World War II, the Catholic Archdiocese of New Orleans purchased one of the last large expanses of open lots in Hollygrove, near the old Ragan Lumber yard, for recreational use by the Catholic Youth Organization. However, no facility was developed and the lots were later sold. The Carrollton Boosters organization, currently associated indelibly with Hollygrove in many minds, only in recent decades acquired the squares behind the Waldo Burton Home, and developed their popular baseball and softball programs (Joseph Macaluso, personal communication 1999).

The post-World War II period did usher in dramatic change in the Hollygrove area. After World War II, the Globe Construction Co. anticipated the hand-in-hand growth of suburban housing and new highway development. Globe bought several undeveloped tracts in Hollygrove and built a large number of duplex units (and a few single residences) in the area bounded by Olive, Edinburgh, Dublin, and Palmetto streets. Another significant development in Hollygrove was the establishment of the Robinson Infirmary and Clinic (now the Carrollton-Hollygrove Center, 3300 Hamilton St.), the first medical facility located in Hollygrove. Highway redevelopment soon dramatically altered traffic flows in and through the upriver portions of New Orleans. Earhart Boulevard was opened as far as Monroe St. in 1952, creating a busy auto traffic intersection at Colapissa, Earhart, and Carrollton Avenue. This area again changed considerably when the Earhart Expressway was completed in the 1980s. The New Basin Canal was infilled during the administration of Mayor "Chep" Morrison, the first step in the eventual construction of the Pontchartrain Expressway and U.S. Interstate Highway 10 across the city of New Orleans. After parts of the Archdiocese of New Orleans' properties in the area of Carrollton Ave. and the former New Basin Canal were taken for construction of the Pontchartrain Expressway, the Archdiocese decided to sell much of the tract. In the 1950s, four-plex apartments were constructed on squares between Palmetto and Palm streets behind Dante St. by Macaluso Construction, and in the late 1950s and early 1960s Globe Construction bought up empty lots on Leonidas, Joliet, Forshey, Oleander, and Palm Street above Monroe. Carrollton Shopping Center and the Carrollton Gardens Apartments were constructed in the 1960s. In addition, in the 1960s, most of the remaining dispersed vacant plots in Hollygrove were built on in a "scattered site" development, in locations to which city utilities had not formerly been extended (Joseph Macaluso, personal communication, 1999; Sanborn 1949; N.O. City Directories 1945-1951).

Beginning in the late-1960s, the Hollygrove neighborhood began to experience loss of residents to the suburbs. Some of the relatively small houses in Hollygrove had reached an age where middle-class homeowners chose to move out of them and relocate to larger houses in newer subdivisions. The Illinois Central tracks (out of use ca. 1954) were removed from the embankment in the mid-1960s and the right-of-way sold. Instead of a boon to property values resulting from the

tracks falling out of use, redevelopment was delayed, and Hollygrove, Oleander, Cherry, and Fig streets were evidently not cut through the embankment until the late-1970s. Colapissa continues to have a cul-de-sac where it meets the embankment. Long-time residents complain about the maintenance of the embankment after it was sold by the I.C.R.R.; caretakers hired by the owner to keep grass cut failed to mow anywhere but the top of the embankment, and once the shoulders of the embankment were overgrown, they attracted litter and trash dumping. Suburban flight and greater accessibility of out-of-neighborhood supermarkets and shopping centers undermined neighborhood businesses. The small commercial districts on Monroe and Hollygrove streets withered; many of the small neighborhood grocery stores closed. Bars and liquor stores replaced some of the grocery stores, contributing to petty crime and litter problems more typical of inner-city conditions, rather than the semi-suburban neighborhood of earlier decades. Meanwhile, Earhart Boulevard, constructed in the second half of the 1950s, ended abruptly at Monroe St., and largely served as a conduit for traffic from Carrollton Avenue to downtown. Then, completion of the Earhart Expressway in the early 1980s destroyed some housing and commercial buildings in the Hollygrove area, and contributed further to shoppers bypassing central Hollygrove for businesses elsewhere. The out-migration of residents from Hollygrove was accelerated by all of these developments. The population of Hollygrove originally reflected a racial mix with a preponderance of whites, but from ca. 1970 neighborhood residents have become increasingly African-American, and are now almost entirely African-American above Cambronne St. (Carll 1980, 1981; Lewis 1976:46; Joseph Macaluso, personal communication 1999).

CHAPTER 5
THE NEW ORLEANS, JACKSON AND GREAT NORTHERN RAILROAD, THE ILLINOIS CENTRAL RAILROAD, AND THE HOLLYGROVE RAILWAY EMBANKMENT

Introduction

The New Orleans, Jackson, and Great Northern Railroad was chartered in 1852 and was the first trunk railroad line to be built from New Orleans. As such, it represents a milestone in the development of New Orleans as a major regional and national transportation center. The New Orleans, Opelousas, and Great Western Railroad was also incorporated the same year, but when completed it ran only from Algiers to Brashear City (Morgan City). The N.O.J. & G.N.R.R. (popularly called the "Jackson Road") directly connected New Orleans with other rail lines in central Mississippi, and eventually with the principal rail-line network of the Mid-Western states. Aside from the economic consequences of the Jackson Road, its very construction through the difficult south Louisiana landscape was a signal achievement for the financiers and engineers of antebellum Louisiana.

> How little the railroad traveler, thoughtful only of speed, comfort, and cheapness, sees of the formidable works over and through which he is so safely and rapidly carried! How little he knows of the herculean labors that have been performed, the anxieties that have been borne, the skill and invention that have been brought into exercise, the desperate difficulties that have been surmounted, in order to provide for him those two parallel lines of iron over which he smoothly guides and peacefully snores. Yet for boldness of design, skill in construction, and success in completion, the gigantic achievements of engineering performed in the laying of great railroads, greatly surpass in magnitude as well as in utility, those that have left their own monuments from earlier ages [Flint 1868:19].

The New Orleans, Jackson and Great Northern Railroad

The idea of building what would become the New Orleans, Jackson and Great Northern Railroad was developed at a series of Railroad Conventions held in New Orleans, Jackson, Mississippi, and Monticello, Mississippi in 1851. Among the notable figures attending these conventions were: Judah P. Benjamin and his partner John Slidell, prominent lawyers; James Robb, New Orleans coal gas manufacturer, banker, and art collector; James L.D. DeBow, editor and publisher of *DeBow's Commercial Review*; Colonel William S. Campbell, railroad engineer; John J. Guion, Mississippi lawyer; and Colin S. Tarpley, Mississippi's leading agricultural authority. Participants were concerned over the possibility of a trunk railroad line terminating at Mobile, Alabama, which, it was feared, would divert investment and development from the Mississippi-Louisiana delta region. Discussions were held about the construction of trunk line railroads from New Orleans to Nashville, and from New Orleans to Texas. It was proposed that a line be built from New Orleans to Jackson, Mississippi, thence to connect with the Mississippi Central R.R. at Canton and allowing rail service from New Orleans to Nashville. Colin Tarpley was a powerful orator at these meetings. His impassioned eloquence reached the pitch of a revival evangelist, and deeply impressed those attending the conventions. Tarpley stoked enthusiasm for the project in general, touting the potential benefits a railroad would bring to the region. His rhetorical images included a vivid word picture of an oxcart mired in mud on an unimproved road, struggling to get a few bales of cotton to a steamboat landing. Furthermore, Tarpley spoke strongly against a proposed terminal of the line on the north shore of Lake Pontchartrain, arguing instead for a more difficult and expensive direct connection with New Orleans. The latter proposal prevailed (Bishop 1917; Prichard 1947:1133-1135; Corliss 1950:175-176).

Provisional arrangements were made in April 1851 for a subscription of funds for construction of the railroad, anticipating incorporation, and about $300,000 was subscribed for survey and planning work. In June 1851, William S. Campbell was named engineer-in-chief and the same month James Clarke began survey work on the Louisiana portion of the route. It took nearly a year to survey through forests, swamps, and marsh from New Orleans to the pine bluffs north of Pass Manchac. The New Orleans, Jackson & Great Northern Railroad was chartered on April 27, 1852 under the terms of Act 176 of the Louisiana legislature. The first chairman (later president) of the railroad was James Robb, and the office of the line was at 17 Commercial Place. The capital stock of the railroad was initially fixed at $3 million and then increased to $8 million, with subscriptions from private investors, the State of Louisiana, and the City of New Orleans (Bishop 1917; Prichard 1947:1133-1135; N.O.J. & G.N.R.R. Scrapbook).

Although the route for the N.O.J. & G.N.R.R. seems to have been settled early on by the engineers, some opinion held that the route chosen was impracticable because of swamp and trembling prairie conditions between New Orleans and the Mississippi state line. Controversy also arose over the decision to locate the main New Orleans depot on the upriver side of the New Orleans (New Basin) Canal. This was a necessity to avoid a technically difficult and expensive high-rise bridge. The chosen route began at Calliope and Solis streets, following the alignment of Calliope St.; to the west of Toledano St. (now Washington Ave.), it deflected westerly and ran nearly due west to the property of Minor Kenner (now Kenner in Jefferson Parish). From Kenner's tract, the route then curved north toward Mississippi. Rights-of-way were obtained from the relevant Jefferson Parish property owners in 1852 and 1853, including through the current project area, then part of the town of Carrollton (Bishop 1917; Conveyance Office Books, Jefferson Parish; Porter 1862:69).

The right-of-way for the New Orleans, Jackson and Great Northern Railroad through the incorporated town of Carrollton was surveyed in 1852. On May 11, 1853, the town council (consisting of Mayor Edward Niegel, F. Fischer, F. Schuler, Frederick Kern, Sam R. Walker, J.L. Donnellon and P. Stoulig) ceded to the railroad the right-of-way across the as-yet undeveloped back lands of the corporation:

> Resolved, That [*sic*] the right of way through the streets of Carrollton as designated... be, and is hereby granted; provided, that the New Orleans, Jackson and Great Northern Railroad Company will make the necessary culverts for draining the city, as they may be required at times by the Mayor and Council of this City; nor shall said railroad company extend their railroad nearer to the river than 12th street, nor further towards the [New Basin] canal than 16th street [Porter 1862:69].

Thus, the boundaries of the right-of-way could not extend further than the area between modern Apricot and Palm streets, and in fact, the railroad track as built remained within these boundaries. The right-of-way remained the property of the N.O., J. & G.N.R.R. and its successor railroad entities at least until the 1960s. Aside from engineering considerations of the railway location (discussed below), it may be that at this time the corporation could grant rights to this corridor because 12th street was the furthest back private property boundary in Carrollton. The N.O.J. & G.N.R.R. right-of-way crossed the track of the Jefferson and Lake Pontchartrain Railroad (which followed the alignment of the modern Upper Protection Levee) in the vicinity between modern Apricot and Pritchard streets, in what was then Jefferson Parish. From the intersection of these two tracks, the N.O.J. & G.N.R.R. track ran west to Kenner.

Construction of the line began soon after right-of-way was obtained. Details of the construction of the line in the current project area are discussed below. After a relatively slow start, construction progress was more rapid once the track was extended as far as the bluffs near Hammond. By the end of 1853, the directors of the N.O.J. & G.N.R.R. reported that the "graduation, cribbing, and piling of near seventy miles" of track had been completed, including

cribwork across the "swamp prairie" (Robb 1854:7). On February 20, 1854, James H. Grant, Chief Engineer of the N.O.J. & G.N.R.R., reported that the roadbed was finished and track laid on miles 1 to 3 (from the Depot to approximately Hamilton St.), and roadbed finished and track half-laid on miles 3 to 11. Grant stated that, "no difficulty is anticipated with that portion of the road crossing the swamps and prairies on crib-work" (N.O.J. & G.N.R.R. 1852; Grant 1854; Campbell 1855; Taylor and Neu 1956:43). The official opening of service on the N.O.J. & G.N.R.R. was on August 6, 1854, when an excursion train ran to the end of the completed tracks at Bayou Labranche (Campbell 1855; Corliss 1950:178).

Construction continued and in April 1856, the Bogue Chitto valley was reached; simultaneously, track had been extended north from Jackson to Canton, which was reached on June 1, 1856. The track had been completed from both directions to the vicinity of modern Hazlehurst, Mississippi by March 1858. On March 31, a special train left New Orleans for the ceremonial uniting of the tracks, which the tracklayers had actually connected on March 22. The highly-decorated train was packed with the officers of the railroad and distinguished guests. A cannon on a flat car announced the passage of the train to the countryside. Near Hazlehurst (named later for chief engineer George H. Hazlehurst), the train halted and all disembarked. New Orleans, Jackson, and Great Northern Railroad president John Calhoun drove the ceremonial final spike (Corliss 1950:179-180).

By 1858, the N.O.J. & G.N.R.R. was completed to Canton, 206 miles from New Orleans, at a total cost of $4.7 million. This cost averaged about $23,000 per mile, plus an additional $138,000 already spent beyond Canton by 1858. Graduation had cost $9,000 per mile, the imported rails $7,300 per mile, and other track materials and labor nearly $3,000 per mile. In 1858 the line had 22 locomotives, each purchased at an average cost of about $9,000 (Flint 1868:348-350; Prichard 1947:1135-1136; White 1997:22), designated by names instead of numbers: they were, in order of acquisition, the "New Orleans," "Creole," "Dart," "Manchac," "Mississippi," "Louisiana," "Jackson," "Canton," "Osyka," "James Robb," "Pelican," "Virginia," "Florida," "Georgia," "Crescent," "Magnolia," "Black Prince," "Eclipse," "Champion," and "Alabama." Most of these engines were manufactured by two of the largest locomotive manufacturers of the antebellum period, the Baldwin Locomotive Works and the Norris Locomotive Works, both of Philadelphia. All but a few of the engines were the eight-wheel 4-4-0 "American"-type general-purpose locomotive that predominated in the United States into the 1880s (Figure 9) (N.O.J. & G.N.R.R. 1858; Corliss 1950:181-183; White 1997).

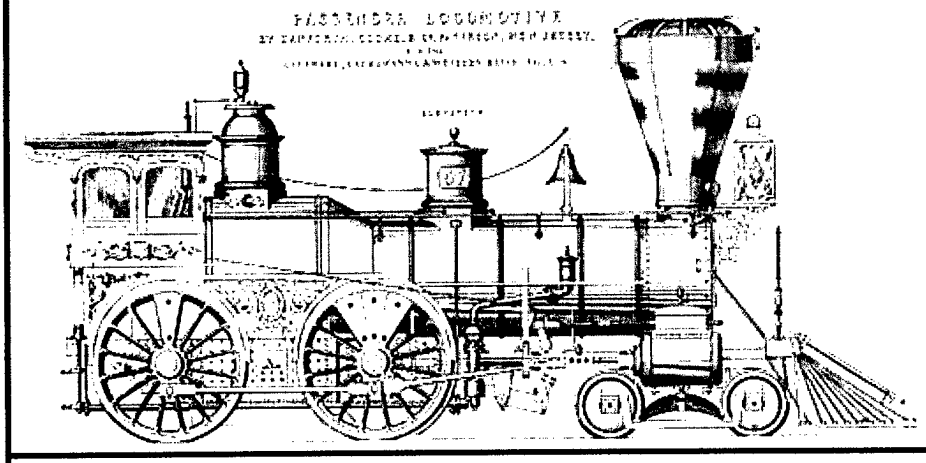


Figure 9. A 4-4-0 "American" locomotive of the type that became standard on American railways in the 1850s and predominated until the 1880s. This example was manufactured by Danforth, Cooke, & Co. in 1857 (from White 1997).

The train engineers of these early days were colorful characters, and evidently, many of them were Irishmen. The Mortagh brothers, Tom and Pat, were engineers of the "Crescent" and "Black Prince," respectively, both Norris engines with 5½' driving wheels. The brothers were renowned for their heated arguments

over the supposed superiority of each of their engines. The efficiency of their locomotives was high, at about 85 miles to the cord of wood burned; but to their chagrin, they were consistently bested by engineer Ed Daley and his "Louisiana," which averaged 95 to 98 miles per cord of wood burned (Corliss 1950:181-183).

Railroad travel in the antebellum period was considered safer than traveling by steamboat, but it was certainly far more dangerous than it is today. Relatively common were derailments, exploding locomotive boilers, collisions, other catastrophes, and lesser accidents such as running over livestock or persons who fell from moving trains. In the mid-1850s, about one in 188,000 ticket-buying railroad passengers in the U.S. was killed in railroad accidents. This meant that the American railroad traveler was 9 times more likely to die in a railroad accident than a passenger in France, and 35 times more likely to die than a rail passenger in England! An unusual incident that nevertheless illustrates the lack of safety features and precautions on antebellum trains occurred on the Jackson Road in 1858. Engineer Odell (O'Dell) parked his train when one of the cars broke an axle, and dismounted from the locomotive, presumably to inspect the damage. The train was still under steam, and suddenly lurched forward. Several passengers assembled on the rear platform of the last car were violently thrown to the ground. The engineer-less train then proceeded into a head-on collision with an oncoming train. Odell fled the scene, disappearing into the surrounding woods, and was pursued as a fugitive from justice (Alvarez 1974:83, 94-95).

By the end of 1859, a system of lines connected New Orleans by rail (with short gaps in various spots) with Memphis, Charleston, Chattanooga, Lynchburg, Washington, Baltimore, Philadelphia, New York, Jackson (Tennessee), Mobile, Cairo, and Chicago. As originally proposed, the N.O.J. & G.N.R.R. was to connect New Orleans with Nashville, but completion of a direct connection did not occur until after the Civil War. Gross earnings of the Jackson Road for 1860 totaled over $1.27 million, of which nearly $560,000 was net profit. By 1861, all of the crib-work over the swamps and trembling prairies between New Orleans and the Mississippi line had been filled with earth, and already-constructed embankments were enlarged. At the outbreak of the Civil War, the N.O.J. & G.N.R.R. was Louisiana's largest and most important railroad. Gross profits for 1861 were over $1.1 million despite the eruption of war, while net profits surpassed those of the previous year, totaling $596,947 for 1861. At the beginning of 1862, the road had about 45 locomotives, 37 passenger cars, and over 500 freight, baggage, and gravel cars. Locomotives purchased since 1858 included the "Sultan," "President," "Mohawk," "Star," "Rover," "Mezeppa," "Corsair," "Hercules," "Eagle," "Vulcan," "Hornet," "Dragon," "Hope," "Comet," "Victory," "Cupid," "Cavalier," "Lion," "Brilliant," "Messenger," "Mercury," and "Atlas." Between New Orleans and Jackson, a depot had been established approximately every 10 miles, and many of these isolated stations eventually became the nuclei of flourishing towns. To March 1, 1862, expenditure for real estate, right-of-way, construction, and buildings stood at over $6 million; another $1 million had been spent on engines, cars, and machine shop tools, for a total of $7.2 million for the road and its equipment. Interest payments were nearly $1.5 million. Contingencies, legal expenses and taxes, advertising and printing, commissions, etc. totaled $400,000. The grand total for expenditure on the N.O.J. & G.N.R.R. by March 1862 was $8,984,548 (Flint 1868:351; Bishop 1917; Corliss 1950:176-183; Estaville 1989:23; Prichard 1947:1135-1136).

The N.O.J. & G.N.R.R. line became a vital strategic artery in the early days of the War. Before the seriousness of the war really took effect, service on the N.O.J. & G.N.R.R. and other lines continued with remarkably free flow of passengers and freight to and from the northern states. Travel and shipping on the line was curtailed in early 1862. With the collapse of resistance around New Orleans, the railroad played a crucial role in evacuating Confederate troops and war materiel out of reach of the northern forces. As Federal forces closed in on New Orleans, General Mansfield Lovell ordered on April 24 that all of the locomotives and rolling stock be moved north of Ponchatoula. Control of the railroad in Confederate territory was

returned to the civilian management in May, and they tried to keep the line functioning as wartime conditions rapidly degraded equipment and facilities. The U.S. Military Railroads took over operations in New Orleans, and the line figured prominently in Union operations along its route. During the conflict, the railroad suffered devastating damage to track, stations, and rolling stock, particularly north of Manchac.

Federal troops repaired much of the line between Ponchatoula and New Orleans (a distance of 32 miles) by June 24, 1865, when the U.S. Military Railroads returned the N.O.J. & G.N.R.R. to its civilian directors. The machine shop and its tools were turned over to the directors shortly thereafter. Between New Orleans and Ponchatoula, all the rolling stock that remained were one locomotive, three passenger cars, two cattle cars, one baggage car, one provision car, and two flat cars. Between Ponchatoula and Brookhaven, a distance of 81 miles, nearly all depots and bridges were destroyed by fire or damaged by neglect, and many miles of track were ruined; three-quarters of the crossties needed replacement before the line could be safely operated. North of Ponchatoula, four locomotives, four passenger cars, and 36 freight, baggage, and other cars survived, but were nearly all damaged. From Brookhaven to Canton, the road was still mostly in use, but in dire need of maintenance (Flint 1868:352-353; Bishop 1917; Prichard 1947:1137-1138).

At the conclusion of hostilities, C.C. Shackelford became president of the N.O.J. & G.N.R.R. and T.S. Williams was named general superintendent. In July 1865, Shackelford went to Washington and negotiated postal commissions and the purchase of rolling stock from the Federal government. The cost of the stock purchases was to be offset by wartime claims for appropriated tracks and other materials, and for which the railroad held receipts from the Federal government. Williams soon resigned and was replaced by former Confederate General P.G.T. Beauregard. Shackelford also soon resigned, and was replaced by John G. Gaines, who served 11 days as president before being replaced by Beauregard. T.S. Williams again became general superintendent, and Ben H. Green was named chief engineer. The railroad was reopened to the public on October 3, 1865, and repairs past Manchac began in December. Beauregard and his team successfully negotiated a second mortgage of the bonds held by northern and European investors, and pushed restoration efforts vigorously. By April 1867, only 16 months after the major repair program began, Beauregard reported that the railroad was operating regularly on 206 miles of track, making the New Orleans to Canton run in 13 hours. Total gross revenue for 1866 topped antebellum levels, reaching $1.63 million. The following year, the road had 27 locomotives, 30 passenger cars, nine baggage cars, 133 box cars, 155 flat cars, seven stock cars, 15 wood cars, and 35 pairs of timber trucks. Ninety bridges had been reconstructed and 50,000 new crossties installed (Flint 1868:353-356; Corliss 1950:173, 205-207; Estaville 1989:11-38; Bishop 1917; Prichard 1947:1137-1139).

The Jackson Road ran through a bucolic landscape past the New Orleans City limits for decades after its construction. Livestock on the tracks remained a problem along the line for years (Figure 10), and even an occasional alligator basking on the tracks required the trains to halt while the beast was convinced to vacate the right-of-way (Figure 11) (Corliss 1950:183). The right-of-way was fenced after the Civil War with wire fencing, in the twentieth century strung between concrete fence posts (Joseph Macaluso, personal communication 1999).

Despite huge efforts to revitalize the line in the post-Civil War period, intractable financial difficulties soon embroiled it in litigation. Former president James Robb filed a chancery suit against the railroad, and Henry S. McComb of the Southern Railway Association also sued. In 1870, the Board of Directors fell out among themselves, with the result that two competing boards were formed, one led by Beauregard and one led by Henry S. McComb. Matters landed in Federal court, which eventually decided for the McComb interest. In April 1872, the Illinois Central Railroad became an investor in the financially strapped N.O.J. & G.N.R.R., the first step toward the eventual consolidation of the Jackson Road with the Illinois Central. Beauregard

Figure 10. A drawing by A.R. Waud entitled "Extremes Meet on the Jackson and New Orleans Railroad" (from Swanson 1975:99).

retired in 1873, the year of a major national economic downturn that seriously affected many already-struggling southern railroads. In addition, in 1873, the N.O.J. & G.N.R.R. combined with McComb's Mississippi Central Railroad, becoming the New Orleans, St. Louis, and Chicago Railroad. After the repairs made under Beauregard, little maintenance or improvement work was done to the old Jackson Road line, and consequently it deteriorated badly while under McComb's control. The New Orleans, St. Louis, and Chicago Railroad defaulted on the interest on bonds it had issued, and was sued by the bondholders in 1875. On March 10, 1876, J.B. Alexander and Gen. R.P. Neely were named receivers. In November 1977, the court decreed the sale of the New Orleans, St. Louis, and Chicago under foreclosure on the mortgage. The railroad was purchased by the bondholders at a public auc-tion and emerged as the Chicago, St. Louis, and New Orleans Railroad. The Illinois Central R.R. was the principal bondholder. In addition, in 1877 James C. Clarke (who had surveyed the N.O.J. & G.N.R.R. route as a young man) of the Chicago, St. Louis, and New Orleans Railroad began a thorough rebuilding and improvement program that brought the track up to the standards of the Illinois Central. Among Clarke's achievements was the conversion of the line from the old common southern track gauge of 5' width to the gauge of 4' 8½", standard for Illinois Central and other northern railroads (discussed in greater detail below). The Illinois Central Railroad took over full control of the line on January 1, 1883 (Waldo 1881; Corliss 1950:173, 205-207; Estaville 1989:11-38; Ward 1994:xviii; Bishop 1917; Prichard 1947:1137-1139).

The Illinois Central Railroad

The Illinois Central Railroad system was one of the major players in the history of United States railroads, and the New Orleans area was an important factor in the system's success. The Illinois Central, soon after its full incorporation of the Jackson Road in 1883, quickly replaced the old N.O.J. & G.N.R.R. depot at Calliope and Solis streets with a station designed by Louis Sullivan, the noted Chicago architect. The Yazoo and Mississippi Valley Railroad was incorporated as a division of the Illinois Central system in 1882, and two years later, a rival line, the Louisville, New Orleans, and Texas Railroad, completed a rail line from Memphis to New Orleans. The L.N.O. & T. was consolidated with the Y. & M.V.R.R. in 1892, and thus

Figure 11. An alligator lurks in the undergrowth near the Jackson Road embankment in the south Louisiana swamp. The engraving was likely made in the 1860s or 1870s, before the Illinois Central R.R. enlarged the embankment and improved its maintenance. Note the small size of the embankment, palmetto growing on it, signs of erosion, and possible ponding on either side (from Waldo 1881).

the I.C.R.R. gained a second route coming into New Orleans (Corliss 1950:232-244, 330), now the alignment of Earhart Blvd. The former Jackson Road track became the outbound Illinois Central track and the former Y. & M.V.R.R. track became the inbound track.

In the early 1890s, cotton had become a major freight item in the Illinois Central system, and one-tenth of the nation's crop was being shipped to New Orleans by rail. The Illinois Central Railroad spent millions of dollars acquiring new right-of-way in New Orleans and building the huge Stuyvesant Docks, completed in 1897. This facility burned in 1905, but was rebuilt the following year. It eventually extended the length of the Mississippi riverfront from Napoleon Ave. to Louisiana Ave., and became the largest privately-owned waterfront terminal in New Orleans. Stuyvesant Docks also handled grain, coffee, tobacco, and sugar. In 1899, the Illinois Central built yards in Jefferson Parish reputed to be the largest single-line yard in the world, named after I.C.R.R. vice-president and head of operations James T. Harahan (Corliss 1950:232-244, 330).

The New Orleans terminal of the Illinois Central was also instrumental in the development of the international trade in bananas, and by extension, the rise of "banana republics." In 1870, it is estimated that perhaps one American in ten thousand had ever seen a banana, but James Tucker, an Illinois Central freight agent in New Orleans, predicted that the fruit would one day "be a standard article of diet in millions of American homes" (quoted in Corliss 1950:403). One steamer arrived in New Orleans from South America in 1874 with a load of plantation-grown bananas; six years later, the Chicago, St. Louis, and New Orleans shipped 22 carloads. During 1881, the line's waterfront facilities expanded from 90 feet to 825 feet, and by the end of the year the Chicago, St. Louis, and New Orleans had shipped 331 carloads of bananas from New Orleans in the preceding 12 months. The number and extent of American-owned banana plantations in Central America grew rapidly. The Illinois Central shipped 1,769 carloads of bananas from New Orleans in 1885, and in 1893, the record train time from New Orleans to Chicago was set not by a passenger express, but by a "banana special." The "Nancy Hanks," pulling fifteen cars, departed the Thalia Street wharf at 12:30 PM on February 20, and arrived at the banana house, South Water St., Chicago, at 12:15 AM, February 21. The train traveled 912 miles (with 40 stops en route) in 35 hours and 45 minutes, a remarkable feat for the time. The Illinois Central shipped 8,000 carloads of bananas from New Orleans in 1900, 28,478 carloads in 1920. After a drop during World War II, banana shipments from New Orleans reached 52,757 carloads in 1947, making the Illinois Central by far the largest banana shipper in the world (Corliss 1950:401-406).

The Illinois Central, like other U.S. rail lines, has ultimately suffered in the twentieth century from the rise of alternative passenger and freight transportation, despite efforts to compete with newer forms of transportation. The Illinois Central was an innovator in establishing off-line pick-up and delivery service of less-than-carload freight, first tried experimentally at stations between New Orleans and Baton Rouge in 1930. Passenger service sought to offer greater comfort and speed. The Illinois Central commitment to passenger service in this period was exemplified by the all-new "streamliner" Panama Limited, which started in 1934. The new Panama Limited reduced time from Chicago to New Orleans to eighteen hours, two hours shorter than any previous rail service, with passengers riding in air-conditioned comfort. Further substantial innovations in passenger rail service were delayed by World War II, but the Illinois Central invested heavily in ultramodern passenger equipment as soon as production regulations were lifted. At a cost of $10 million, passenger equipment was replaced. On April 27, 1947, the luxurious streamliner "City of New Orleans" went into daily service, reducing the time from New Orleans to Chicago yet further, to sixteen hours. Nor was freight service ignored, with replacement of rolling stock, improvements and enlargements to freight yards, and modernization of track; these and other improvements allowed freight trains to run from Chicago to New Orleans in 36 hours. Total expenditures by the Illinois Central Railroad during 1945-1949 totaled $134 million for: new and better locomotives and cars; heavier rails; improved bridges;

shops, machinery, and tools; ballasting; new stations and shop buildings; improved signals; and other improvements. Meanwhile, one of the significant developments in New Orleans railroads in the post-World War II era was the decision in 1947 (after years of negotiations) to replace the Illinois Central Union Passenger Terminal with a city-owned terminal. Construction of the new passenger station (currently known as Union Station) was begun in 1949 and the new station was dedicated in 1954 (Corliss 1950:450-453; Yakubik and Treffinger 1995:9).

Unfortunately for the Illinois Central Railroad, it was not immune to the forces that led to the general decline of railroads in the twentieth century, and its heavy postwar investment in passenger rail service was ultimately for naught. Competition from trucking, pipelines, the automobile, and airplanes led to decline in freight and passenger revenues; the Illinois Central "downsized" and sold some unprofitable routes, but has ultimately survived where other regional and national railroads have failed.

Construction of the New Orleans, Jackson and Great Northern Railroad Embankment and Later Modifications

Philip McGovern was the original contractor for construction of the first three miles of the Jackson Railroad track, from the depot at Calliope and Solis streets to the vicinity of modern Hamilton St. On January 17, 1853, McGovern's contract was forfeited, and it is at least possible that he lost his contract because of sub-standard work, as discussed below. The contract for miles 1-3 was let for completion to Thomas C. Bates & Co., who completed construction by February 1854. Original contractor for miles 3 to 11 (west of Hamilton St.) was the firm of Coleman and O'Shaugnessy (N.O.J. & G.N.R.R. 1852; Grant 1854; Campbell 1855).

Limited primary documentation is available concerning nineteenth-century railroad track engineering (e.g., Colburn and Holley 1858; Perdonnet 1858) from which to derive an understanding of the technical aspects of the features observed during excavation. In general, standardization of rails, track-laying methods, and other engineering features occurred in the late-nineteenth century, and in the antebellum period every railroad designer and engineer felt free to adopt whatever technologies and methods he favored.

Generally, antebellum rails were lighter, and groundwork preparatory to track-laying much less extensive, than in the later decades of the nineteenth century. Antebellum trains derailed frequently because track-laying methods were barely adequate even with the light locomotives (usually weighing less than 30 tons) and small cars of the period. The tracks were of iron, not steel, and derailments resulted from warping and other deviations in the relatively soft and light-weight tracks. Tracks are discussed in more detail below. In well-drained locations, road beds were often constructed with little sub-surface preparation, because moving large quantities of earth with hand methods was very labor-intensive and expensive. Some southern railroads failed to ballast their tracks at all in their haste to get revenue loads running as quickly as possible. With inadequate attention to drainage, tracks were easily washed out by rains and freshets (Ward 1994:xv).

The specifications for the roadway of the N.O.J. & G.N.R.R. represented a robust engineering philosophy for their day. They called for single-track roadbed on level terrain to be prepared to a width of 22' (at the top surface of subgrade) and double-track roadbed with a width of 30', both with shoulders steeply sloped at 1:1½'. In the case of the Jackson Road, the topography between New Orleans and the blufflands north of Lake Pontchartrain required elevation of the track above the surrounding ground surface. Embankments were to be prepared 16' wide (at the top surface of subgrade) for a single track and 26' wide for a double track, with 1:1½' slopes to the shoulders. By way of contrast, twentieth-century specifications of the Illinois Central railroad called for fills 20' at the top surface of subgrade for single tracks and a 34' wide subgrade surface for double tracks (N.O.J. & G.N.R.R. Scrapbook; Tratman 1926:19-

27). The N.O.J. & G.N.R.R. specified that all trees, bushes, stumps, or roots within the right-of-way were to be cut level with the surface of the ground. The cypress timber was to be stacked and the rest of the cleared vegetation burned (N.O.J. & G.N.R.R. Scrapbook). These stipulations for clearing for graduation do not mention grubbing or the removal of stumps and roots. This suggests that the engineers expected the track grade to be elevated significantly above the ground surface.

Elevation of the track was necessary because not far above the upper New Orleans boundary (Toledano St.), the N.O.J. & G.N.R.R. route had to contend with swampy conditions. The curve of the Jackson Road track route in the current project area was determined by a regular arc (of 11,468 foot radius) from the alignment beside and above the New Basin Canal to a line that ran (with slight deviation from due west) from the J. & L.P. R.R. embankment to Kenner (Bishop 1917). The entirety of the curve ran through back lands, and in the historic past (before the modern drainage system was begun in the 1890s), the current project area was likely inundated much or most of the time. It was, in fact, most usually characterized as a swamp, and the

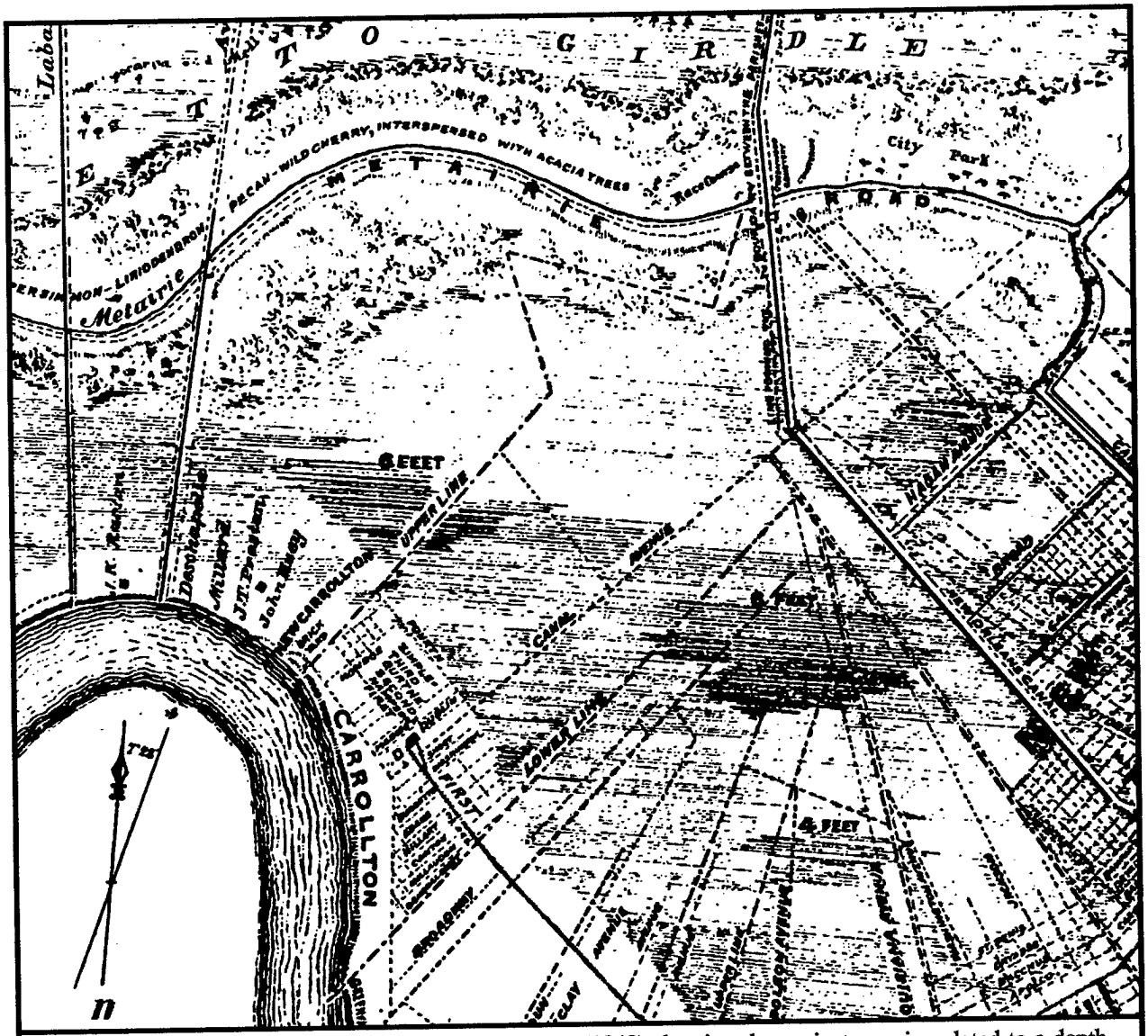


Figure 12. The *Diagram showing... Sauve's crevasse* (1849) showing the project area inundated to a depth of approximately six feet above the ground surface (The Historic New Orleans Collection).

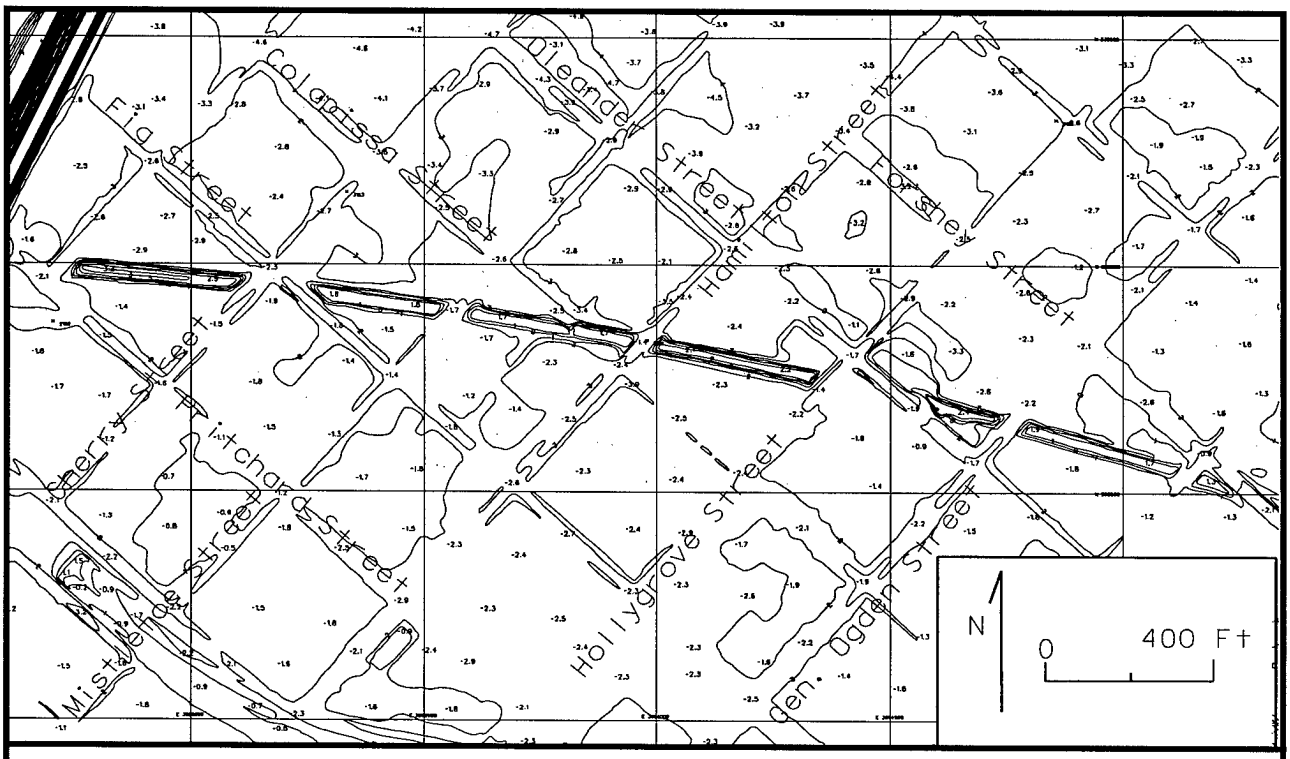


Figure 13. Excerpt from the US Army Corps of Engineers digitalized topographical data for Orleans Parish showing vicinity of the Hollygrove embankment (New Orleans District, US Army Corps of Engineers).

vegetation would have originally been dominated by cypress trees. Carlos Trudeau's *Map of the City of New Orleans and the Adjacent Plantations* (1798) is labeled "Cypress Swamp" where the current project alignment is located (Figure 2). The area was not perpetually flooded, but the average depth of inundation in the area is not known. The *Diagram Showing... Sauvé's Crevasse* (1849) (Figure 12) shows the area inundated to a depth of approximately six feet above the ground surface. William Williams mentioned that the "swamp in the rear of Carrollton lies about seven feet below the level of the high grounds bordering on the river... and this basin, in its natural condition, was covered with water during the largest part of the year" (Williams 1876:25). Elevation data and soil characteristics of the current project alignment corroborate historical descriptions of the area. The soil of the project area is Harahan-Westwego type, indicating that the area was a swamp prior to draining (Trahan 1989).

At the time of the 1893 drainage survey, the elevation of most of the project area was approximately at or below Mean Gulf Level. Since levees on Lake Pontchartrain had not yet been constructed, it is likely that any standing water in the area varied with river levee crevasses, the level of the Lake, and precipitation levels. Current elevation data supplied by the COE indicates that the modern zero elevation line (measured from the NGVD) is roughly parallel to Dublin St., from South Claiborne Ave. to Palmetto St., and lower toward the lake. According to digitized COE topography data (Figure 13), in the immediate proximity of the embankment, elevations fluctuate around 1½ to 2½ feet below NGVD. Very generally, current elevation data shows the terrain higher south of the embankment and sloping downward toward the northwest from the embankment, suggesting that the surveyors and engineers placed the embankment on or near a natural contour line. Within two blocks (about 200 m) of the embankment, elevations as low as nearly 5 feet below NGVD occur, and within three blocks (about 300 m), elevations occur as low as 6 feet below NGVD. It is possible that some of the lowest elevations in the vicinity represent borrow areas dating to the period of embankment construction, as discussed further below. The frequency of standing water and unsuitability of the soil for construction in the

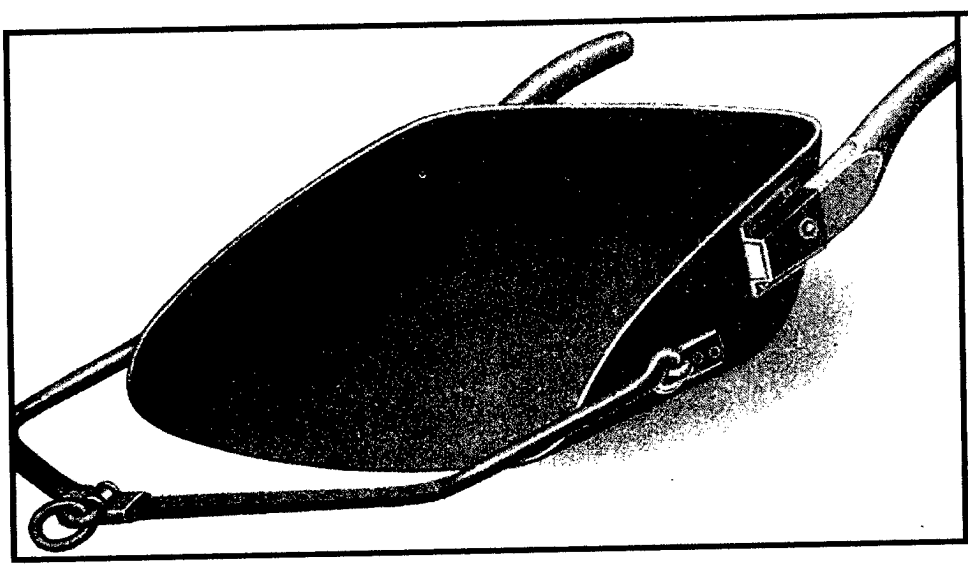


Figure 14. A standard No. 2 drag-scraper from the early-twentieth century (Crandall and Barnes 1913:21).

project area would have required either an embankment or a wooden-supported trackway westward from approximately the point where the track right-of-way crosses modern Dublin St., if not further toward the N.O.J. & G.N.R.R. depot.

The amount of hand labor required to build a raised embankment was prodigious. Although rail-mounted mechanical excavators or steam shovels (invented in 1838) had been used in railway construction from the early 1840s, there were almost no specialized machines for track construction work in widespread use, such as elevating graders, self-propelled steam pile drivers, steam-powered draglines, track-laying machines, specialized dump cars, ballast hopper cars, etc. Until the end of the nineteenth century, railroad construction depended heavily on the brawn of men and horses (Martinson 1959:2-1; Crandall and Barnes 1913:15, 49-50). Among the few labor-saving devices available was the drag scraper, which was utilized in midwestern railway construction in the early 1850s where soil near the railway was suitable for their use (Lightner 1977:19). In the later-nineteenth century, the ordinary No. 2 drag scraper (Figure 14) weighed about 100 pounds empty, was drawn by two horses (or mules), and held from 1/7 to 1/9 cu. yards of dirt. Fill for an embankment was taken from a borrow area that had been plowed or the soil loosened with picks and mattocks. Usually one man performed the scraping and another drove the scraper to the dump, since the scraper could usually be filled faster than it could travel to the dump and return (Crandall and Barnes 1913:21). Laura Ingalls Wilder (1967) watched in fascination as a western gang graded a railway with drag scrapers in the post-Civil War period, and recalled their methods with almost textbook accuracy and detail:

> Before them the railroad grade ended bluntly. In front of it, men with teams and plows were plowing onward toward the west, breaking a wide strip of the prairie sod... Between the plowing and the blunt end of the grade, teams and men were slowly going around in a circle, over the end of the grade and back to cross the plowed strip. The teams were pulling wide, deep shovels. These were the scrapers... each scraper had two short handles. And a strong half-hoop of steel curved from one side of the scraper to the other side. The team was hitched to this curve of steel.
>
> When a man and his team came to the plowed land, another man took hold of the scraper handles and held them just high enough to thrust the round shovel point into the loose dirt of the plowed ground while the team went on and earth filled the scraper. Then he let go of the handles, the full scraper sat level on the ground, and the horses pulled it on around the circle, up the side of the grade. On the

> grade's blunt end the men who drove the team caught hold of the scraper's handles and tipped the whole scraper over in a somersault inside the curving steel that the horses were hitched to. All the dirt was left right there, while the team drew the empty scraper down the grade and on around the circle to the plowed land again... Team after team came around the circle, scraper after scraper tipped over...
>
> As the loose soil was scraped from the plowed land, the curve widened out so that the scrapers passed over freshly plowed land ahead, while the plow teams came back and plowed again the ground that had been scraped... When one scraper is filled another is on the spot to take its place, and the scraper holder is there to grab the handles and fill it. The scrapers never have to wait for the plows, and the plows go just so far ahead before they come back to plow again the ground that has been scraped... [the foreman] stood on the dump watching the teams and scrapers circling, and the plows coming inside the circle and moving out ahead of it again... For every six teams, one man did nothing but stand and watch. if a team slowed, he spoke to the driver and he drove faster. If a team went too fast, he spoke to that driver and that driver held his horses back. The teams must be spaced evenly, while they kept on going steadily around the circle, over the plowed land and to the grade and over it and back to the plowed land again.
>
> Thirty teams and thirty scrapers, and all the four-horse teams and the plows, and all the drivers and the scraper holders, all were going round and round, all in their places and all moving in time... just like the works of a clock... "When the grade's finished [said her father]... the shovel-men will come along with hand shovels, and they'll smooth the sides of the grade by hand, and level it on top"... [Wilder 1967:98-105].

A standard drag scraper required seven to ten trips from borrow area to dump per cubic yard of earth deposited, and each scraper could convey about 60 cubic yards in a 10-hour work day. Costs for working in heavy clay, as might have been encountered in the current project area, were 25 or 30 percent greater than when working in lighter soils (Crandall and Barnes 1913:21-22).

It is possible that drag scrapers were not used when the N.O.J. & G.N.R.R. embankment was originally built. The southern states generally lagged behind the north in many applications of newer technologies, and it is therefore probable that steam shovels were not used during initial construction of the Jackson road. If neither scrapers nor steam shovels were used, fill material was removed from the borrow areas with shovels. If suitable fill was not available in proximity to the line, it may have been excavated at a convenient source, and carried in wagons or carts directly to the grading site. Once the road was constructed, fill material could be transported from distant borrow areas to a siding or the main line, or even to a barge landing and thence to a siding, and loaded with shovels on the small gondola or primitive dump cars of the period. Horse-drawn cars could also be used on temporary tracks during construction. Once the cars were pulled to the appropriate portion of the grade, the fill was emptied, either dumped or with shovels. Wilder (1967) describes primitive dump wagons used in railway construction as simple flat-beds with a floor of loose boards, emptied by turning the boards over (Wilder 1967:103; Crandall and Barnes 1913:15, 33-35, 49-50).

Because of the expense of constructing raised, permanent earthen embankments, in the antebellum period embankments were less common than timber trestles or other wooden-supported ways where the terrain was uneven (Meredith and Meredith 1979:182). William Campbell and the other N.O.J. & G.N.R.R. engineers solved the problem of building in the swamp by having the track constructed on "cribbing" or "cribwork." This refers to a temporary track foundation of timbers stacked one on another at right angles in alternate layers to form a quad-

rilateral structure supporting the track. Supporting the track with cribwork was probably an evolution of the "sleeper" method of track-laying on soft ground, used with the strap rails of the 1830s, in which cross-ties were laid on large timbers or sleepers laid longitudinally with the direction of the track (Ward 1977:6-7; c.f. Alvarez 1974). Construction on a cribwork was suitable for conditions of low standing water. Deeper water required a higher trestle, which had to be built on driven pilings. Such was the case for the 2,030'-long trestle at North Pass Manchac and the 790'-long trestle at South Pass Manchac built by the N.O.J. & G.N.R.R. However, the cribwork arrangement was not intended to be the permanent support of the track. The cribbing allowed the track to come into use while an earthen embankment was built over a longer period. Thus, the railroad could operate and receive revenue before the permanent way was constructed (N.O.J. & G.N.R.R. 1852; Crandall and Barnes 1913:158; Van Auken 1916:189; Robert M. Vogel, personal communication 1999).

Newspaper announcements ("To Railroad Contractors") calling for bids on construction of the Jackson Road and specifying materials to be supplied appeared in the English, German, and French-language New Orleans newspapers in July and September, 1852:

> Proposals will be received... for the roadway formation at the rate of [blank] cents per cubic yard, for excavating and embanking...
>
> Proposals will be received at the same time for thirty thousand piles, ten inches square, and from twenty-five to thirty feet in length. Said piles to be of the best yellow pine and free from sap for fifteen feet from the butt. Also one hundred and twenty thousand lineal feet of scantling, either the heart of yellow pine or cypress, eight by ten inches square, and in lengths of twenty-eight or thirty-two feet... to be delivered in various places...
>
> ...[piles] of the best yellow pine hewn square at least two thirds of their length from the butt, and for one half of their length free from sap. The top must have at least eight inches diameter of heart.
>
> The piles must be straight, sound, and free from wind-shakes.
>
> Also for 90,000 lineal feet of sawed timber... free from rotten knots, wind-shakes, or sap...
>
> Also for 60,000 sawed or hewed red cedar cross-ties, nine feet long, six inches thick, and not less than eight inches wide, of the best quality of red cedar, sound and free from rot; if hewed, the two sides must be straight and well dressed, and free from sap within the above dimensions...
>
> Also for 500,000 board measure of yellow pine plank, four inches thick, 12 inches wide, and 20 and 25 feet long, sound heart stuff, free from wind-shakes, and in no case with more than one inch sap on the corners...
>
> Also for 50,000 board measure of two-inch yellow pine plank, 12 inches wide and 20 feet long... [N.O.J. & G.N.R.R. Scrapbook].

The Specifications of the Manner of Constructing the First Division of the New Orleans, Jackson, and Great Northern Railroad (1852) indicates how the cribwork was to be built:

> On those parts of the road where earth cannot be procured to make Embankments, piles will be driven; or, if suitable timber is abundant on the line, the roadway will be formed of timber cribwork, made by laying two pieces of red cypress, hewed

on the upper and lower sides, in the direction of the line, at six or eight feet apart. Transversely on these, at intervals of eight or ten feet, crossties of the same kind of timber; and so alternating until the work is raised to the grade line, always ending at that level with longitudinal timbers, which will support the common crossties and rails. This class of roadway will usually be from two to five feet high, and will be measured by the lineal foot on line when finished, ready for the crossties and rails. When this work is made in prairies and other insecure ground, it will be laid on a flooring of planks or split boards, in the manner directed by the Engineer [N.O.J. & G.N.R.R. 1852, *sic* throughout].

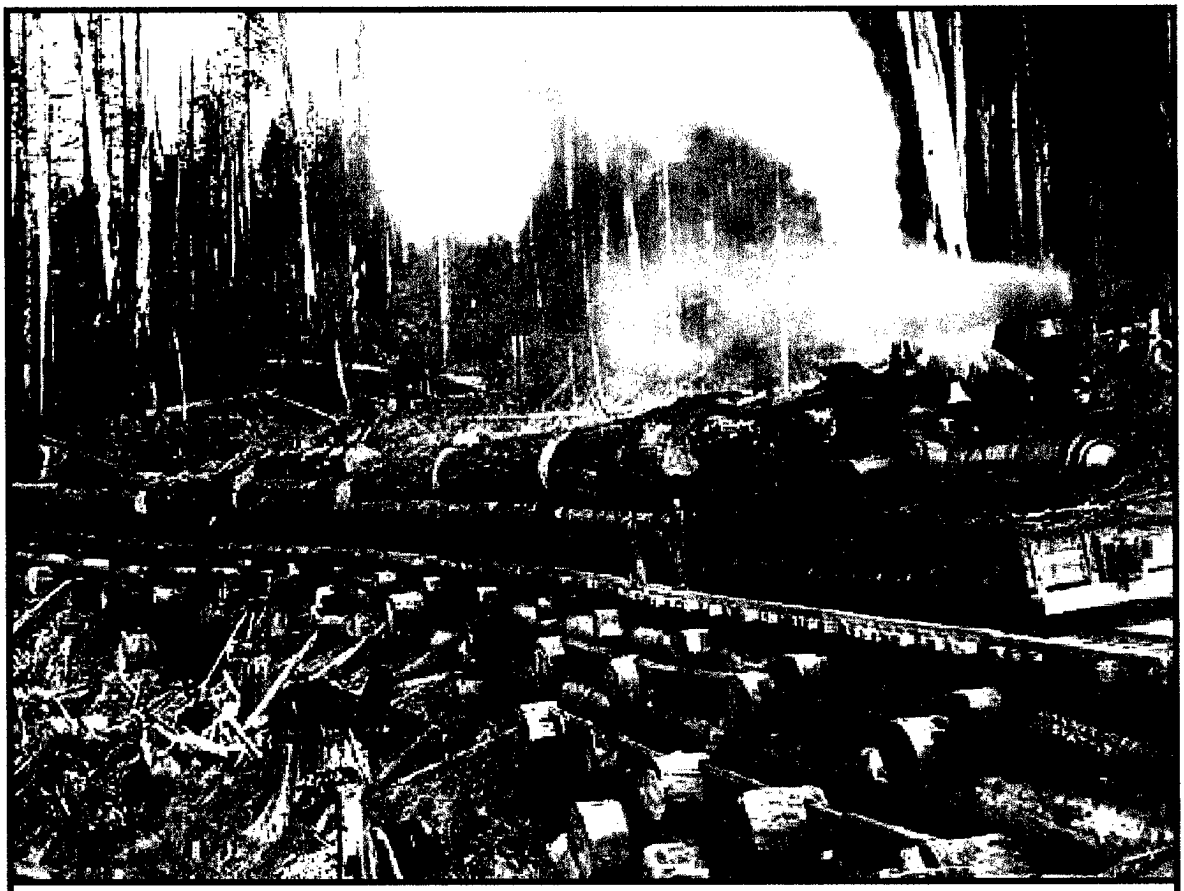
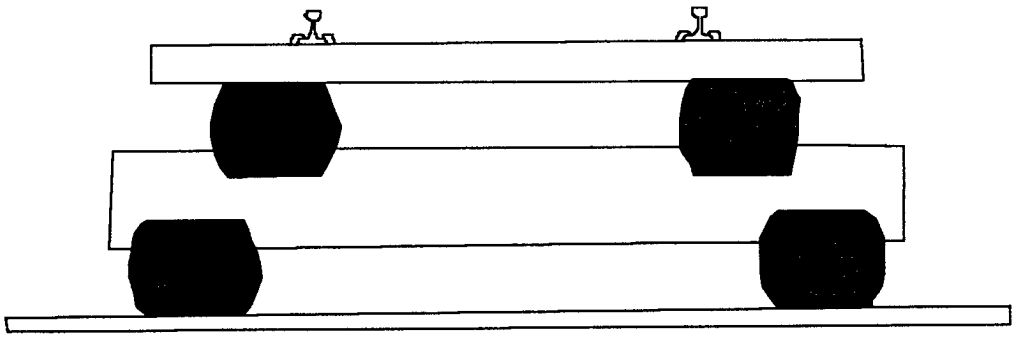


Figure 15. A cribwork supporting a logging train in Skagit County, Washington, photographed by Darius Kinsey in 1902. Obviously much higher and more massive than any section of cribwork on the N.O.J. & G.N.R.R. line, it uses nearly identical techniques to those specified in notices to contractors for the Jackson Road.

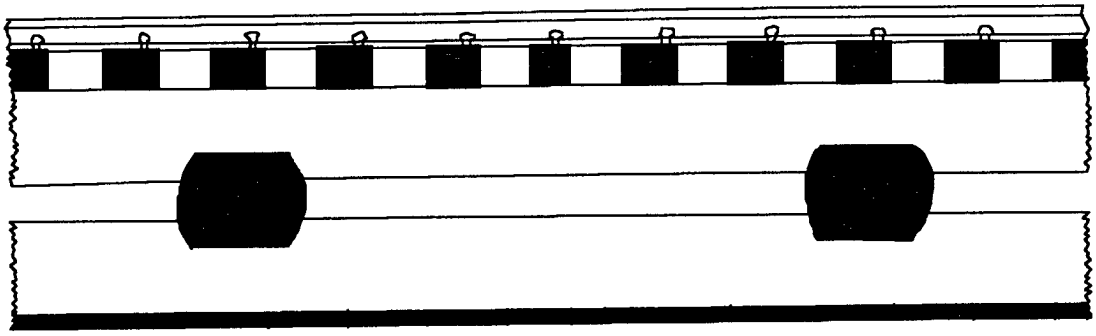
The *Annual Report* of the N.O.J. & G.N.R.R. for 1852 also described how the cribwork was to be constructed:

> Longitudinal with the road there will be laid twelve feet in length of two-inch plank; on these, at distances of eight feet from centers, will be laid cross timbers fourteen inches thick between sides, and twenty-two feet long. On these, string pieces, and then cross ties, ten feet long, ending with longitudinal timbers to receive the cross ties of the superstructure; the whole will be well fitted and pinned together [quoted in Bishop 1917].

The two descriptions of the cribwork are contradictory. In the first description above, the lowest course of timbers is longitudinal to the line and (apparently) transverse to the line in the second description. This appears to be an error and logically, "longitudinal with" at the begin-



Cross-section



Profile

Figure 16. Profile and cross-section of the cribwork to be built for the N.O.J. & G.N.R.R., as specified in notices to contractors. The principal construction timbers of red cypress were to measure 14" across their top and bottom surfaces.

ning of the second description should perhaps read "lateral to." With this correction, the description fits typical cribwork used in heavy construction (Figure 15). The crib-work as specified in the first description, with additional information drawn from the second description, is illustrated in profile and cross-section in Figure 16. These specifications were evidently not followed in the current project area. The contract cost of constructing the cribwork for the N.O.J. & G.N.R.R. was calculated by the linear foot of cribbing built to a height of up to 3½', from 3½ to 4½', and from 4½ to 5½' (N.O.J. & G.N.R.R. Scrapbook).

Archeological monitoring during floodwall construction in New Orleans in 1986 observed cribworks of varying construction beneath the Public Belt Railroad track alignment between Barracks St. and Montegut St. (Goodwin et al. 1986:95-99). The floodwall alignment cribwork allows some direct comparisons with archeological features observed during current project excavations. The floodwall alignment cribbing probably dated no earlier than the post-Civil War period, when Charles Morgan's Louisiana and Texas Railroad received the riverfront railroad franchise. The cribbing observed in 1986 may have been lighter than that specified for the Jackson Railroad. Evidently, smaller-dimension milled lumber, sometimes doubled together, was utilized rather than hewed logs. The timbers of a crib were typically interlocked, and were usually held together with drift bolts. Drift bolts are actually long spikes driven into pre-drilled holes, and are not threaded for nuts. They essentially act like a nail, and were typically up to about 30" long (Jacoby 1910:46-49). In the case of the cribbing observed in the 1986 excavations, the timbers were interlocked, but no drift bolts are mentioned in the archeological report. In contrast to the riverfront tracks which were constructed in a natural levee setting, within the project area the Jackson Railroad track ran over a swamp, and the cribwork was intended to directly support the crossties temporarily until such time as the cribbing could be infilled with earth. The expectation before excavation was that the large-dimension timbers of the cribwork in the current project area would be notched and pinned. During excavations, instances of notching were found, but no drift-pins were observed (see below).

Whereas antebellum cribworks were perhaps of heavier construction than later examples, the Civil War U.S.M.R.R. engineers constructed standardized trestles, which were far lighter in construction than later standard trestles and bridges. During the war trestles were constructed with prefabricated upright head frames and cross members made of 6-inch by 10- inch timbers. Parallel timbers, supporting the crossties and rails, measured 10 inches by 10 inches. Crossties were only three inches thick and six inches wide (Meredith and Meredith 1979:182). The Jackson railroad crib-work specifications and description calls for much larger timbers than in these trestle standards, but the major elements were placed farther apart than was typical in post-Civil War wooden bridge engineering.

The stratigraphy observed at the 1986 floodwall alignment excavations suggests that at least some of this cribbing was constructed to underlay an earthen embankment, but not necessarily to directly support crossties and tracks. This is because the cribbing does not lie within a ballast matrix; it is instead overlain with approximately 90 cm (2'8") of sandy clay fill above the level of the timbers, which was then topped with 70 cm (2'4") of shell (Goodwin et al. 1986:97). Shell was possibly the original ballast material in this riverfront location, but it is also possible that the sandy clay was originally used around the crossties and that the shell was deposited at a later date.

The original roadbed ballast on the south Louisiana portion of the Jackson Road line was not specified in the available documentation. The L. & N.R.R. tracks constructed in the 1850s utilized a foot of sand and gravel ballast beneath their rails, and the N.O.O. & G.W. utilized sand and shell (Tilford 1951:9; Thornburgh 1950:73). Prior to excavation for the current project, it was inferred that the Jackson Road ballast may have been *Rangia* and oyster shell, since large quantities of shell were purchased by the railroad during the construction period (N.O.J. & G.N.R.R. Scrapbook). The relatively steep shoulders specified for the roadbed suggested that a material other than earth would have been called for, and sand, slag, cinders, or burned clay were all considered as possible ballast material. Broken stone or gravel was considered unlikely in the immediate construction period. However, the excavations suggest that in fact clay was used in the original fill episode and was followed by gravel at a later date, as discussed below.

Current project excavations encountered features that clearly did not represent a regular cribwork as originally specified. It is tempting to speculate that contractor Thomas McGovern

forfeited his contract because of shoddy construction; poor construction of the embankment in this reach was noted in the Engineer's statement in the 1856 annual report of the N.O.J. & G.N.R.R. (N.O.J. & G.N.R.R. 1856:15). However, McGovern could have forfeited his contract by not starting work within a specified period, or some other unknown factor. The irregularity of the wooden features and stratigraphy observed during current project excavation indicate that a cribwork was not constructed to directly support the crossties in this area. Rather, they are consistent with a low embankment constructed of locally-obtained clay fill and utilizing wood from the right-of-way placed irregularly within the fill to stabilize it. Similar antebellum construction methods were recalled by southern railroader N.J. Bell in his memoirs: "we had a dump car that we loaded with waste timber left in the cuts... and pushed it out on a fill and dumped the timber down the banks" (Ward 1994:6).

It was hoped that excavations in the current project area would indicate aspects of track-laying technology in use prior to the late-nineteenth century, when the Illinois Central Railroad revamped the entire track along more modern specifications. The original track on the Jackson Road was manufactured by Wilson, Hallett & Co. of Liverpool, England, and was laid at 5-foot gauge (N.O.J. & G.N.R.R. Scrapbook; Corliss 1950). All rails were wrought iron until the spread of the Bessemer process after 1860, but no standardization had been achieved in the antebellum period and railroad track details and component technologies were bewilderingly varied. Most common in Britain were I-shaped double-head rails, and later, "bull-headed" rails, that is, respectively either symmetrical in cross-section or nearly so. The standard modern American "T" rail has a pronounced flattened base. The antebellum-period British iron rails weighed around 80 to 90 lbs per yard, considerably more than the 54-60 lb rails used by another southern railroad built in the 1850s (the Louisville and Nashville R.R.) (Tilford 1951:9), but lighter than the 100 to 132 lbs per yard modern American steel track. The individual rails were probably 30 feet long, again smaller than their modern counterparts. In distinction to modern American practice, where tracks are welded together or held by steel rail joints, the British rails were jointed in a cast-iron "chair" of various possible designs and keyed with a wooden block. However, there were nearly as many different track technologies as there were railroads. Since no artifacts of the original track and hardware from the antebellum period were recovered in current project excavations, the track engineering details remain unknown.

Jackson Railroad president James Robb was replaced by W.S. Campbell while construction of the line was going on. Campbell informed the stockholders of the condition of the line in his April 1855 report:

> The roughest portion [of the road] is from the city depot to the edge of the trembling prairie, a distance of fourteen miles. A suitable gang of men, working with an engine and a train of dirt cars, are employed in bringing materials from the higher portions of land to fill up and ballast sections of the swamp where the material on the spot is not suitable for a permanent embankment. Except the first mile out of the city, the roadway formation to the edge of the trembling prairie is of earth.
>
> The crib-work is built... over the swamps of cypress. Before any of these structures decay, they will have been substituted by embankment. Already we find the sills have ceased to settle and but little labor is required in repairs. A speed of from 20 to 30 miles an hour over the crib-work is both safe and agreeable... [Campbell 1855].

Campbell's 1855 statement as to the extent of an earthen embankment poses problems of interpretation. "Trembling prairie" referred to areas of undrained marsh (as opposed to swamp) soils, which the right-of-way encountered near the St Charles Parish/Jefferson Parish line at approximately fourteen miles west of the depot (c.f. Matthews 1983; McDaniel 1987). At this

time (1855), the upper New Orleans city boundary was Toledano St. (Toledano St. currently becomes Washington Ave. at Fontainebleau Dr. and intersects the old Jackson Road alignment in the vicinity of Washington Ave. and Calliope St.). This would put the limit of "the first mile out of the city" within the current project area, near modern Eagle Street where it intersects the alignment. If this is the case, Campbell was indicating that the track was on a cribwork between Toledano St. and Eagle St., or from Toledano St. to just below milepost three, which was in the vicinity of modern Hamilton St. Thus, from somewhere within the current project area to west of Kenner, the track may have been on an embankment or on a crib that had already been filled. However, in 1855, the outer edge of city development was approximately at modern South Claiborne Ave., the location of a drainage canal and a drainage machine (at Melpomene St.) from about 1858 (Maygarden 1996:14). Campbell may have been implying that the cribwork extended for one mile from the edge of city *development*, which would mean that an earthen embankment started in the vicinity of modern Toledano St. rather than at Eagle St., and that a cribwork was not constructed (or was already covered and embanked) west of Toledano St. It is even possible that Campbell meant that the cribwork extended for one mile from the *depot*, which would mean that an earthen embankment started near modern South Rocheblave St. In any event, it is not known whether for some time the track remained fastened to crossties resting on the cribbing, or if the roadbed was raised with fill over the top level of any cribbing when it was embanked.

Research has indicated that gravel was used in the first post-construction fill episodes on the southern portion of the Jackson Road. Jackson Road President John Calhoun stated in the *Annual Report* of the N.O.J. & G.N.R.R for 1856:

> ...[the road] between Ponchatoula and New Orleans, forty-seven miles, though now in good condition for running, is not so substantial [as between Ponchatoula and Osyka], about seventeen miles of it being swamp and prairie crib-work, which ought to be filled as soon as possible with gravel from the high lands, to avoid the annual outlay of large sums for repairs, and to secure the safety of trains [N.O.J. & G.N.R.R. 1856:3-4].

The Engineer's Department reported

> ...from New Orleans to Osyka, the track has steadily improved, the running schedule-time of thirty miles to the hour being easily made. The portion of the track through the pine woods has especially stood well the severe test of the past winter, and the repairs will always be light in that section. Over the swamp portion it will be otherwise, until such time as the roadway be made a permanent one. I desire to call your attention particularly to the necessity of doing this at the earliest time that the means at your command will warrant. There remain yet twelve miles of swamp crib-work, and four and one half miles of prairie to be filled. The work in the swamp first requires attention, in consequence of the inferiority of the workmanship and timber in its construction. Accidents over any portion of this, from the height of the track above the swamp surface, must always be serious in their character. Proposals have been made for filling in this section, at the rate of five thousand dollars per mile. The ballasting of the track from Kenner to the city, being the roughest portion, has been commenced, and will be continued until the whole be completed. The gravel for the purpose is brought from near Osyka at a large cost but this will be more than returned in a few years by the consequent economy in repairs [N.O.J. & G.N.R.R. 1856:15].

Two years later, General Superintendent William M. Hadley reported:

> ...on entering upon my duties on the 1st of October [1857], I found much of the track, on the lower part of the road, in very bad order. The treacherous character

> of the road-bed, until high land is reached, renders it very difficult to keep a track up; but in addition to this, as is too commonly the case for the first few years after roads are built, there had not been sufficient attention to repairs, renewing ties, and other wood work...
>
> Looking to the future, I think the whole of the swamp division of the road should be ballasted with gravel, about eighteen inches in thickness, and for that purpose, I have recently purchased a very excellent gravel bed, about one hundred miles from the city [N.O.], from which an ample supply can be had. This will be attended with considerable expense; but, in my judgment, will be economy in the end. We now have a train in this service, and I propose to continue it throughout the year... The balance of the cribwork I propose to dispense with, by substituting embankment. Of this, there is about eleven miles, and it will require from one hundred and seventy to one hundred and eighty thousand yards of earth to fill it. The embankment will be much more firm, by being built about one-half the height and allowed to settle before the balance is put on. I, therefore, propose to carry on this work moderately, looking to its completion during the year 1860. After it has been filled, ballasting will be necessary to make a firm and good road-bed. When this work is completed, and such portions of the road as require it have been ballasted, the road will be equal to any that I have ever seen for solidity; and for alignment, by far the best, taking into consideration the country over which it passes [N.O.J. & G.N.R.R. 1858:20-21].

Hadley proposed that the road obtain a total of eighty 8-wheel gravel cars for ballasting and filling work, and by 1861, 57 dump cars had been purchased. To accelerate the widening of previously embanked roadbed and the filling of the embankment between Kenner and the pine woods north of Pass Manchac, the Jackson Road began to employ a steam shovel in 1861 (N.O.J. & G.N.R.R. 1858:23; 1861:27; 1862:7). The Hollygrove embankment was part of a trunk line main track for about 100 years, and as discussed below, gravel and other fill was certainly deposited in more than one episode. Most of the gravel at the current project site appears to be Roseta gravel originating in the riverbeds of the upper Florida Parishes or in southern Mississippi.

After the cribwork was filled or an embankment otherwise constructed, the surroundings of the Jackson Road track remained swampy. Water levels in the area fluctuated, sometimes dramatically, as regional levee systems were inadequate to prevent periodic inundation. The Jackson Road track was damaged in 1859 by floodwaters of the Bonnet Carré crevasse, and it was necessary for passengers to ride a steamboat from Pass Manchac to the "Carrollton and Lake Railroad" (the Jefferson and Lake Pontchartrain Railroad) landing at West End (Schwab 1973:484). If the J. & L.P.R.R. track was useable, it suggests that the Jackson Road track in the current project area was also probably not damaged by this particular crevasse. Storms in October and November 1860 raised the level of Lake Pontchartrain, again submerging the alignment and temporarily halting service (Prichard 1947:1138). The General Superintendent of the Jackson Road testified before Confederate authorities in 1862 that from milepost one to milepost four (measured from the depot at Calliope and Solis streets), the track ran through a swamp (Scott 1882:578-579). This would have included the area of track approximately from Broad St. to the Upper Protection Levee. On the Abbot map (1863) (Figure 3), the N.O.J. & G.N.R.R. tracks cross an area labeled "Wet Land" toward the Lake and "Cypress Swamp" toward the River.

After 1858, several major drainage features were constructed that changed the topography in the project area. The maps by Sulakowski (1873) (Figure 4) and Hardee (1878) (Figure 5) show the drainage features constructed in 1858-1873, namely the Dublin Canal, the Dublin Drainage Machine, the Fourteenth St. Canal, and its outfall at the Upperline Tail Race (or Upperline Canal). The N.O.J. & G.N.R.R. tracks are shown crossing the Fourteenth St. Canal

through an area marked "Swamp" in large letters. The portion of the project area on the river side of the railroad embankment and the Fourteenth St. Canal drained earlier than the portion on the Lake side of Fourteenth St. (modern Oleander St.). This is indicated by the 1896 Mississippi River Commission map of the area (Figure 7).

Railroad technology was continuing to change rapidly in the post-Civil war era, but under Henry S. McComb's control of the line, the old Jackson Road track was allowed to decline to a marked degree. In the autumn of 1872 Leverett H. Clarke, Chief Engineer of the Illinois Central Railroad, toured the line and found it in bad shape, with narrow embankments and infilled ditches. The situation continued to deteriorate and was not rectified until the Illinois Central became the controlling interest in the Chicago, St. Louis and New Orleans Railroad. By late 1877, things had gotten so bad along the line that in a single month (December 1877), the road suffered one hundred cases of broken rails. General manager James C. Clarke began a vigorous program of rebuilding. By 1880, Clarke had 1.3 ***million*** new ties and 34,000 tons of new steel rails installed, with another 17,000 tons of rails purchased to complete conversion of the entire road. 200 miles of track had been re-ballasted, and some wooden truss bridges replaced with iron structures (Waldo 1881:19; Stover 1955:175-182).

In the fall of 1880, the Illinois Central board asked Clarke to convert the gauge of the Chicago, St. Louis and New Orleans tracks from 5' to the English Standard 4' 8½" utilized by the Illinois Central and the northern railroads. Clarke thoroughly planned one of the most massive gauge-changing efforts ever undertaken in the United States, and the first such effort in the south. On July 29, 1881, over 3,000 men were deployed between Cairo and New Orleans to change the 550 miles of track, with advance preparation, in a little over six hours:

> The west rail was moved inward 3½". All the spikes on the inside of the rails to be changed had already been drawn, except the spike in every fourth tie on straight lines and every third tie on curves. Spikes for the new gauge were already driven in every fourth tie and third. All necessary spikes were distributed on the ends of the ties into which they were to be driven. Each section foreman was furnished with a narrow-gauge hand-car and a full set of tools. The implements were distributed among the men in each section thus: five men with claw-hammers drew inside spikes, one man with a spike-maul drove down stubs, and four men threw in the rail; and there were five outside spikers, two inside spikers, two extra men and one man to push the hand-car and carry water. The sections were clearly laid out in order, each having a roadmaster. Not the least difficult part of the undertaking was the locating of the rolling stock so as not to interfere with the work. But all the directions were fully carried out [quoted in Corliss 1950:207].

Nationally, the adoption of steel rails in the 1870s, combined with roadbed improvements, allowed locomotives and cars to become much larger and heavier. After 1865, the wider introduction of railway steam shovels and other earth-moving equipment also greatly facilitated the replacement of trestlework with graded permanent way. By necessity, trestlework remained in place along some south Louisiana portions of the Chicago, St. Louis, and New Orleans line, and later, along the Illinois Central. But by the early-twentieth century, trestle timbering was also much more substantial than had been the case in earlier decades: typical timber measurements on a single-track trestle were combined stringers measuring 18" by 19" and frame heads measuring 12" by 12". Creosoting of pilings became standard in the 1870s, and greatly lengthened the life of trestle and bridgework timbers (Crandall and Barnes 1913:224; Marshall 1921:2).

With the rebuilding program of James H. Clarke, the former Jackson road embankment entered into its modern period. However, the line was still described as swampy in the *Historical Sketch Book and Guide to New Orleans* (1885):

> By the Jackson Route you skirt the southern shores of Lake Pontchartrain and come into the city over one of the worst *prairies tremblantes* that have ever defied an engineer, the soil a perfect quicksand, which sinks under any weight. Thousands of dollars and millions of cubic feet of earth and lumber have been expended to give the railroad a solid foundation, which has only just been accomplished. As it is, you pass through the dreariest and most dismal swamp it is possible to see...[New Orleans Press 1885:30].

Illinois Central policies also improved maintenance of the track. Once built, roadbeds and ballast require a greater amount of maintenance than the layman might expect. Ditches alongside the embankment would have been dug (if they did not previously exist) and maintained in proper fashion by regular cleaning and re-shaping, and it is likely that the disturbed material dredged from the ditches would be re-applied to the embankment. Railroad roadbeds would have been disturbed by cleaning the ballast and replacement of old or damaged ties and rails to maintain proper grade and drainage. Cleaning and loosening of the ballast was usually done about every three to five years on a heavy-traffic main line no matter what the ballast material. Originally, this was done by turning the ballast by hand with forks. Later, ballast was cleaned by removing the ties and plowing the ballast with an engine-powered dragline, and then cleaning it with other machinery, including pneumatic vacuums. New ballast material was usually added after each cleaning to restore, maintain, or raise the grade level of the track (cf. Colburn and Holley 1858; Perdonnet 1858; Tratman 1926; Tratman et al. 1934).

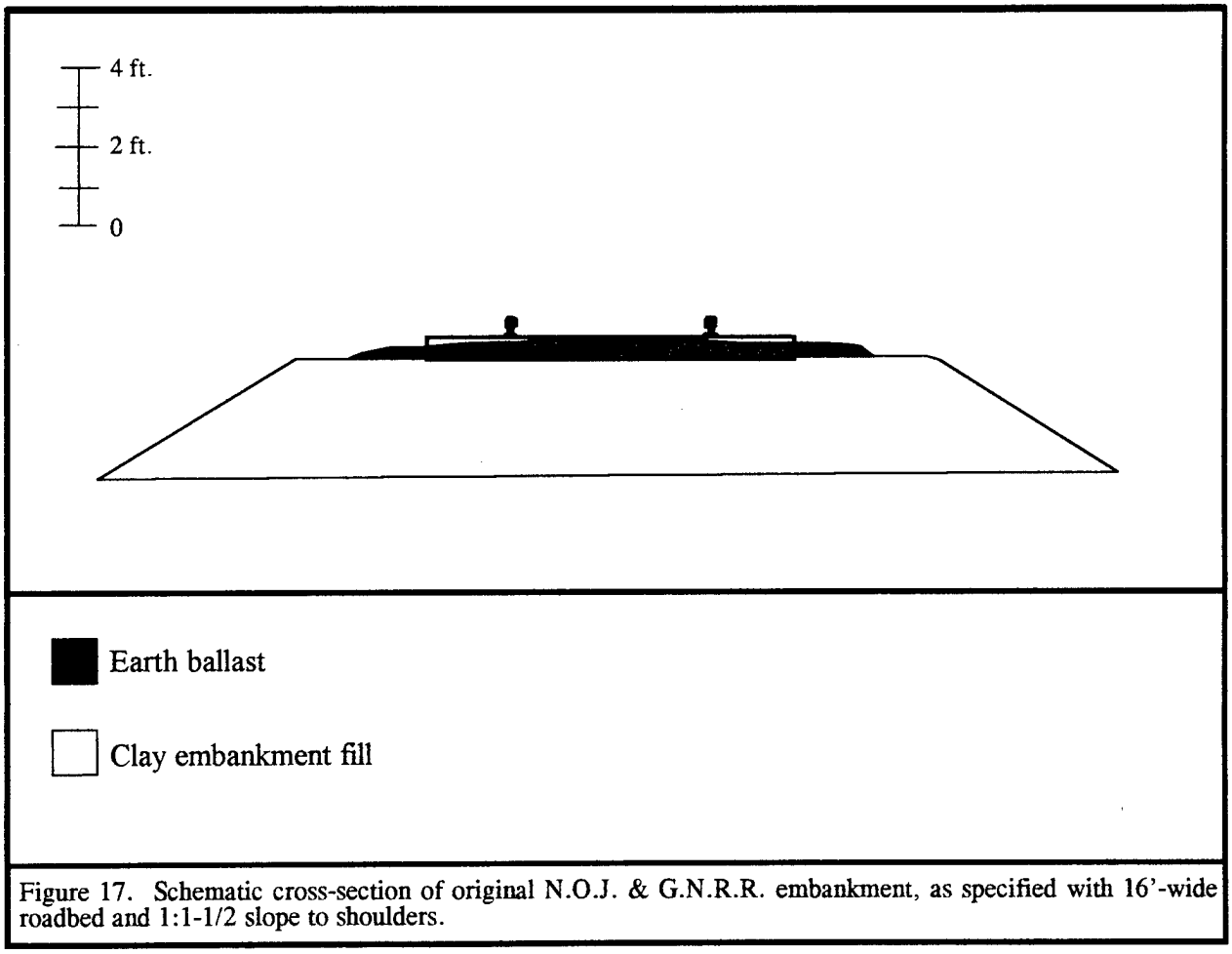


Figure 17. Schematic cross-section of original N.O.J. & G.N.R.R. embankment, as specified with 16'-wide roadbed and 1:1-1/2 slope to shoulders.

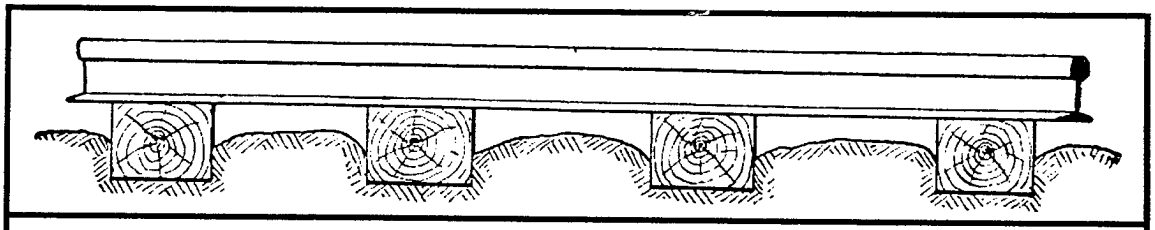
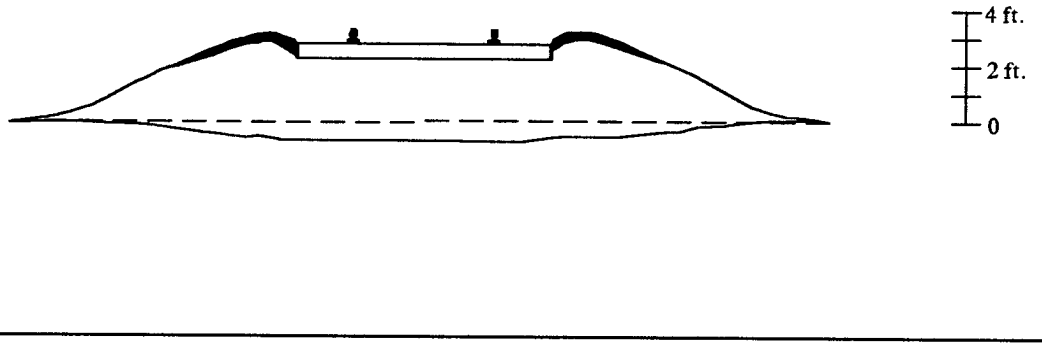


Figure 18. Longitudinal section of a railway embankment showing track crossties sinking into roadbed (from Van Auken 1916:153).

The subject of modern rails is a complicated one in and of itself. Prior to ca. 1895, the engineers of each railroad developed the rail designs in use. Rails differed from each other in numerous dimensions, including weight per yard, height, width of base, and proportions of total weight in head, base, and web, as well as the angles and curves of sections. These differing designs all performed differently in service. In 1893 the American Society of Civil Engineers adopted standards for rail design, and these were substantially revised in 1906 and 1907. In 1909 the American Railway Association produced their own standards for rails, and in 1919-1920 the American Railway Engineering Association issued a further set of standards. The A.S.C.E and then the A.R.E.A. standards became the most prevalent rail types, although several others remained in use on major railroads. Among these were: rail sections designed by P.H. Dudley for the New York Central Railroad beginning in 1883; sections used by the Pennsylvania Railroad; standards established by the Manufacturors Association; and standards promulgated by the American Society for Testing and Materials. The tendency over time was for rails to become larger and heavier, since heavier rails allowed heavier traffic and provided economies in operation by lowering resistance per ton of train weight, reducing tire wear, and extending the useful



Earth ballast

Clay embankment fill

Figure 19. Schematic cross-section of leveled track in embankment creating concave or trough-shaped embankment crown (adapted from Van Auken 1916:153).

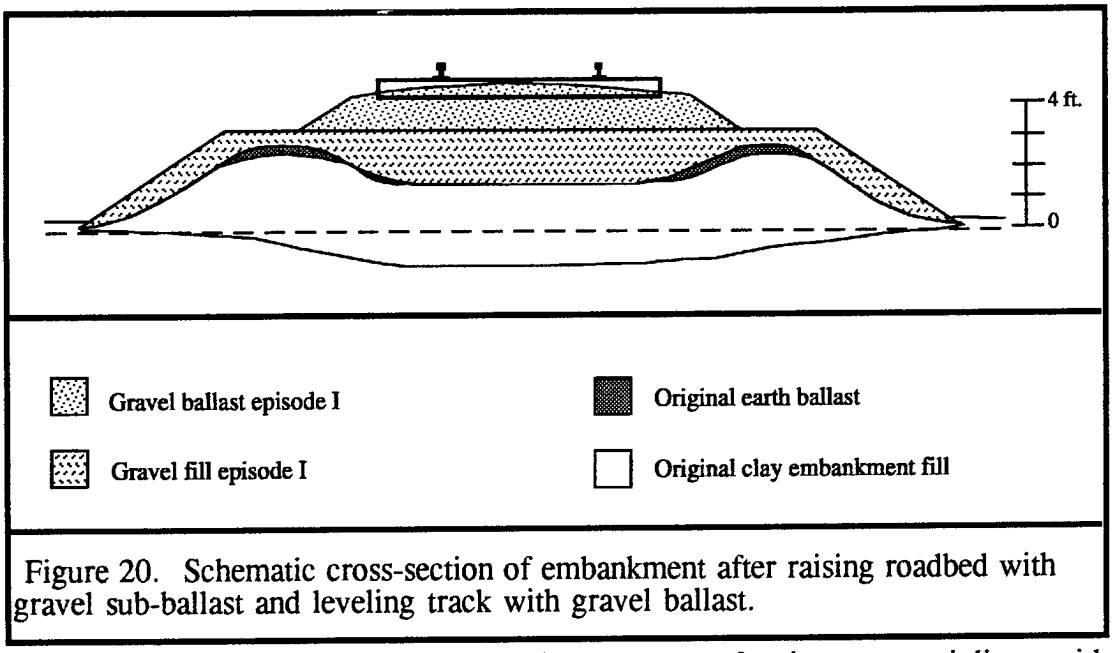


Figure 20. Schematic cross-section of embankment after raising roadbed with gravel sub-ballast and leveling track with gravel ballast.

life of the rail head. By ca. 1925, 100-pound rails were most often in use on mainlines, with 110-120-pound rails on heavy-traffic lines and a few rails in use weighing up to 136 pounds per yard. Eventually some particularly heavy-duty rails weighed 152 pounds per yard. The Illinois Central Railroad evidently adopted rail standards of its own similar to those of the Pennsylvania Railroad system. By 1950, mainline track rails of the Illinois Central Railroad weighed 132 pounds per yard (Crandall and Barnes 1913:255-258; Tratman 1926:60-78; Raymond et al. 1947:97-105).

It is possible to hypothesize a very general sequence of embankment development, derived from discussions in Van Auken (1916) and Tratman (1926) and depicted in Figures 17 through 21. The observed stratigraphy in the excavated portions of the embankment (see below) suggests that the initial fill episode may have consisted of locally obtained clay. Cypress knees were observed that probably were at ground surface preceding the historic construction of the embankment. These knees were surrounded with tree stumps and trunks and covered with clay, beneath the level of the gravel that makes up the bulk of the embankment. The presence of a clay level above the historic ground surface may indicate that the embankment was filled in this area during initial construction, and that the wooden features did not directly support the crossties of the first track. It is possible that the crossties were laid on top of the leveled clay surface in the initial construction, or they may have been ballasted with clay between the ties (Figure 17). Within a short time, the ties would have sunk into the clay fill of the embankment, appearing in longitudinal- or cross-section as in Figure 18. In this situation the track would have required frequent leveling, probably by jacking up the track, moving the dirt from between the ties to underneath them, and tamping the dirt down. The tendency under these conditions would be for the top of the embankment to become trough-shaped (Figure 19) (Van Auken 1916:152-155, 165; Tratman 1926:17-31, 264-265).

The consequences of a trough-shaped embankment subgrade were predictable; the subgrade, in this case clay, would retain water and become soft. As the subgrade softened, the track would subside or sink. The preferable solution to the soft, water-saturated subgrade was to re-shape the shoulders of the subgrade. The shoulders would be cut down, and the material used to either widen the bank, raise the ties, or both. Finally, permeable ballast material such as gravel would be applied on top of the re-shaped subgrade to level the track. Often ballast would also then be applied to raise the track; but, unless the subgrade of the embankment was re-shaped, constant re-filling would be required in a futile effort to keep the ballast and track from subsiding into the

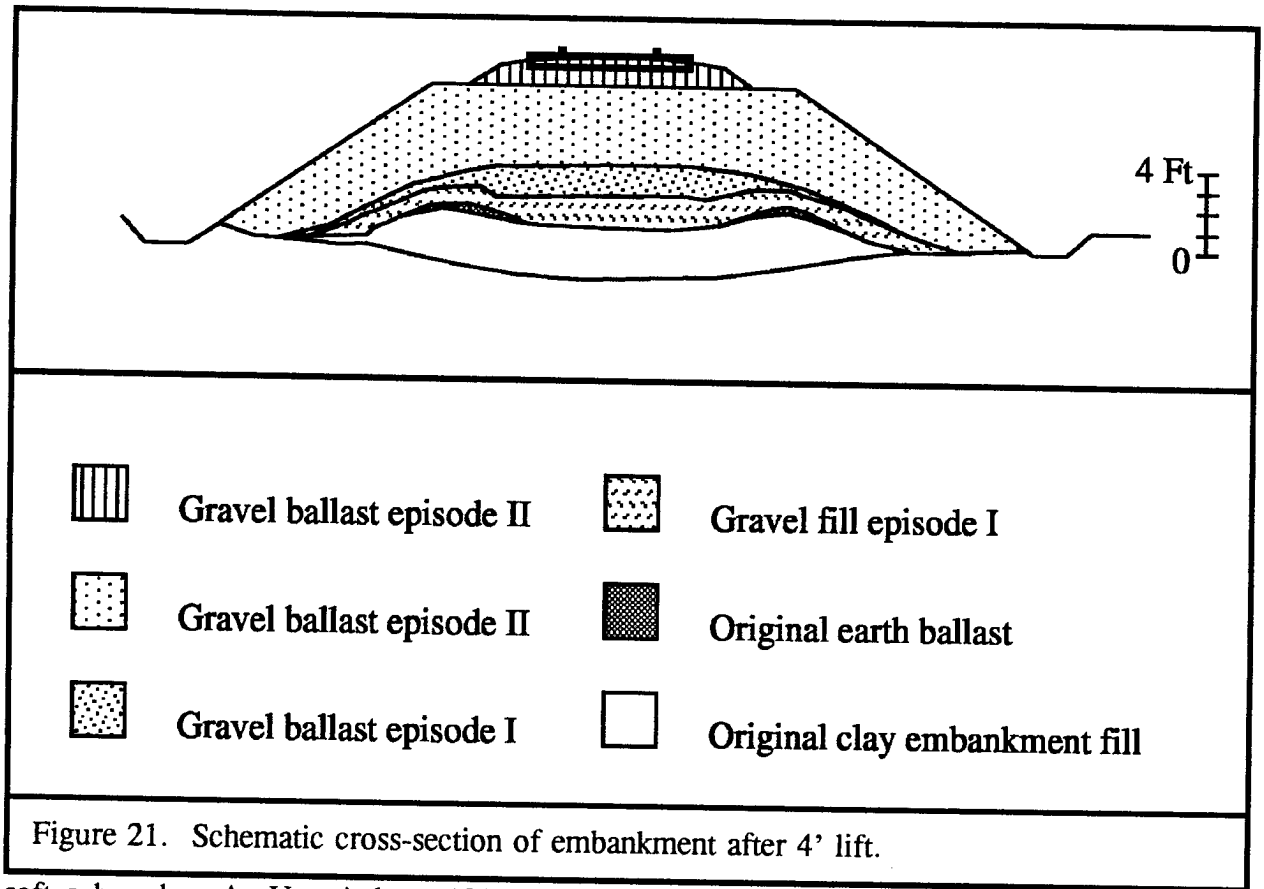


Figure 21. Schematic cross-section of embankment after 4' lift.

soft subgrade. As Van Auken (1916) remonstrated, concave subgrades were frequently not corrected in this manner, and were instead just buried under layer after layer of ballast. Ballast depths could and frequently did reach four feet above subgrade as a result, even without deliberate attempts to raise the track significantly. Whether or not the subgrade was re-shaped, after ballast was applied the shoulders of the track, it was then dressed (or shaped) to the standards of the railroad (Van Auken 1916:152-155, 165; Tratman 1926:17-31, 264-265).

It appears that in the current project area the clay subgrade was not re-shaped when the track was leveled and raised subsequent to original construction. Instead, repeated layers of sub-ballast and ballast (both consisting of similar gravel) were put on the embankment both to level the track and raise it (Figures 20 and 21). Since the core of the subgrade remained soft, the roadbed continued to sink beneath the weight of trains passing above. Original engineering features and earlier fill or ballast materials subsided further into the wet soil and subgrade. Shoulders were also eroded by precipitation, decreasing the angle of their slope over time. These shoulder slopes were routinely re-graded to standards of the railroad.

The current project embankment was certainly raised on more than one occasion. This probably occurred in increments from 2 to 12 inches in a single lift, with lifts combined up to a total of several feet in each of one or more raising episodes (Van Auken 1916:164; Tratman 1926:263-268, 384-385). Tratman (1926) describes the grade-raising method employed by the Illinois Central in the first quarter of the twentieth century:

> On lines in the lowlands... the grade is sometimes raised to be above flood level, the height of lift being from one to five feet... such work [was] done under traffic on the Illinois Central R.R.... In fills, material was placed by 20-car trains of air-operated dump cars controlled from the locomotive, 20-yd. cars being used on the smaller and 30-yd. cars in the higher fills. When the fill came up to roadbed

> level, it was spread clear of the track by a spreader car and powerful locomotive. Raising the track was done in lengths of 1,000', with 1' lift in each length by a gang of 40 men. Thus for a 4' raise, there would be four 1,000' lengths in progress, the first at the original grade and the others 1',2', and 3' above it, all on a narrow fill. Behind this was the final dumping for permanent grade and width, with a gang of 40 men adjusting the running tracks between this and the preceding section, which was still 1' below final grade. The track was raised by jacks while earth was shoveled under the ties, and the dump-car train was then run over the track thus raised to deposit material for the next lift. In this way, the raising was kept in advance of the dumping, which was an advantage in wet weather [Tratman 1926:384-385].

As the embankment was raised, it inevitably grew wider as the shoulders were graded to a consistent slope after each episode of ballasting. Before new ballast was applied, previous ballast would have been cleaned and loosened, and it is likely that plowing with draglines would have lowered slope angles of previously deposited ballast. Plowing likely also disrupted previous strata of ballast and fill, creating disturbed cross-section profiles. Low lifts probably produced thinner strata above the outer edges of the trough-shaped subgrade (Figure 20), whereas later and higher lifts deposited the most material in those same vertices above the shoulders of the subgrade (Figure 21). As the embankment was raised, any ditches alongside would be filled and relocated to the exterior edge.

The height of the embankment grade has thus always been dynamic, and it is difficult to say how its elevation related to the ground surface at any given point in time. The embankment was raised while the relative and absolute elevation of the surrounding ground surface varied over time because of deposition and subsidence. The tendency of the subgrade materials was to continue sinking under the weight of trains in the softer central portion of the embankment. It is possible that subsidence of the embankment actually accelerated once the water table in the area had been lowered by modern drainage features (Trahan 1989:42-44).

An elevation profile (Figure 22) of the modern embankment within the current project impact area, from Forshey St. to the Upperline Canal, indicates several salient features. The remaining portions of the embankment are lower in relation to street grade (and NGVD) at the eastern end (toward Carrollton Ave., beginning at Dublin St.) and rise toward the west, reaching approximately 3.3 feet (1 m) above NGVD or 5.4 feet (1.65 m) above ground surface at Live Oak and Pritchard streets. Notable also are the variations in grade on either side of Oleander Street and approaching the Upperline Canal. The original grade would ideally have been consistent, that is, in a nearly horizontal straight line of elevation, without fluctuations along any given length of alignment. The present variations in grade are probably the result of bridges over the 14th St. Canal, and the Upperline Canal and Levee. Both of these bridges were built after the original embankment. The 14th Street Canal was constructed ca. 1871 and probably infilled ca. 1898. The 1929 Sanborn map of the Hollygrove area indicates that the bridge over Oleander St. (the 14th Street Canal) had again been replaced by an embankment by that date. Probably the bridge was removed soon after the canal was infilled. Bridge construction and then re-construction of the embankment may have contributed to the disturbance of features in the area excavated between Hollygrove and Gen. Ogden streets. The Upperline Levee followed the alignment of the Jefferson and Lake Pontchartrain Railroad embankment after 1863, and was substantially increased in height during the twentieth century until reaching its current elevation. The Upperline Canal was extended far enough to intersect the Illinois Central embankment between 1898 and 1916, and after the canal was built, a bridge would have been constructed to carry the track across it. Subsequent widening of the Upperline Canal and increase in height of the Upper Protection Levee (post-1927) would have required a raising of the embankment and an increase in the size and height of the bridge at the upriver end of the current project area to prevent a major variation in grade at the Upperline Levee. Current conditions where the former I.C.R.R.

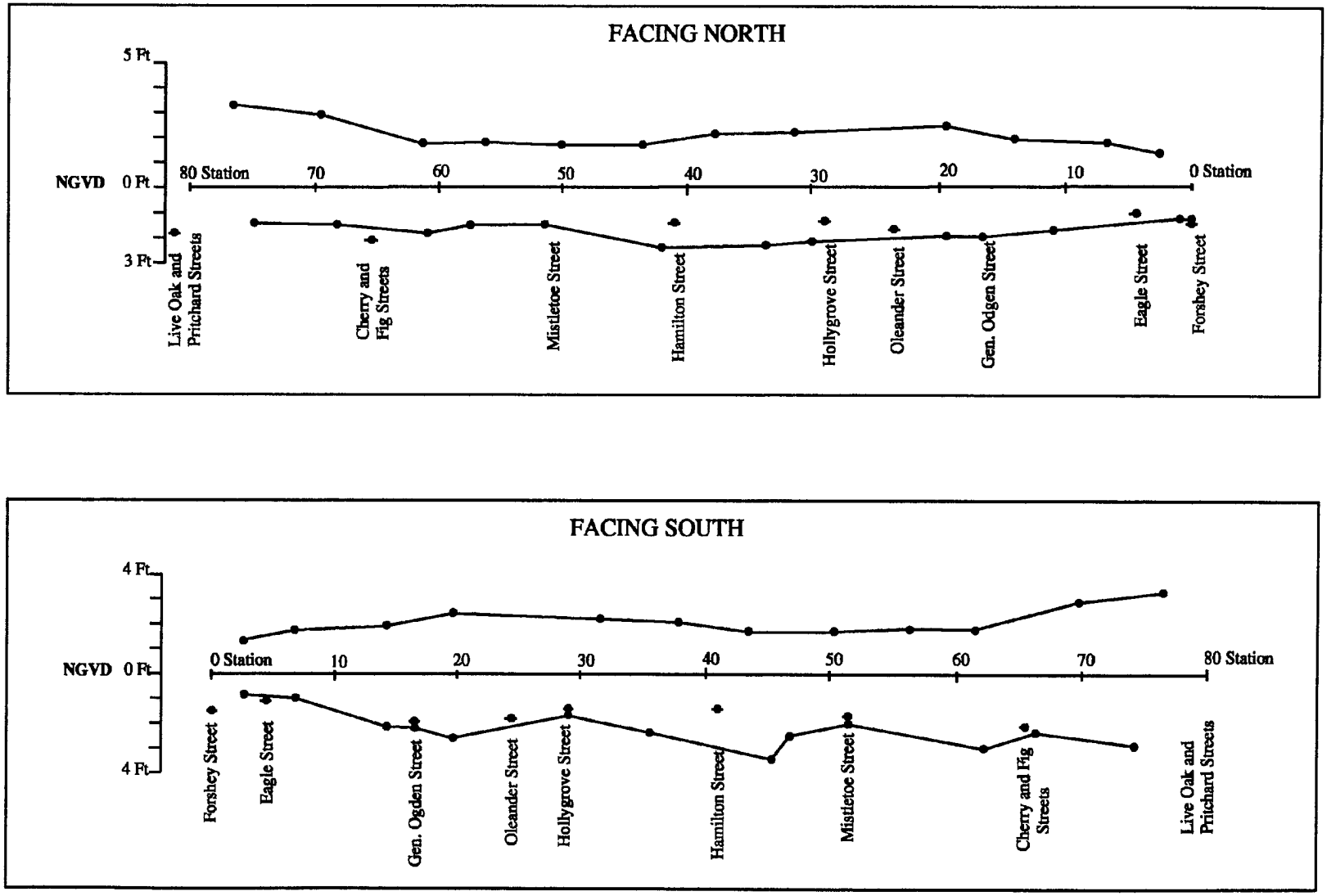


Figure 22. Elevation profiles of the Hollygrove embankment. The vertical scale is exaggerated.

embankment alignment crosses the Upperline Canal, on both Jefferson and Orleans Parish sides of the canal, suggest that the grade in fact sloped up noticeably towards an apex on the bridge over the canal. Unfortunately, neither detailed documentation of the elevation and construction of the bridge over the Upperline Canal and Upper Protection Levee, nor current elevation or topographic survey information for Jefferson Parish, could be obtained.

The treated pilings observed during excavations between Mistletoe and Cherry streets were probably the result of efforts to stabilize the embankment at some time after its initial construction. Treatment of pilings and crossties with various chemical preservatives was practiced on a limited basis in the antebellum period, so it is possible that at least some of these pilings date to the original construction episode. The initial construction specifications called for squared pilings, but obviously some contractors did not follow the letter of the specifications. However, creosoting of pilings became more common in the post-Civil War era, and the irregular arrangement of the pilings makes it highly unlikely that they supported a trestle or other track-supporting wooden way. Even in the antebellum period, trestles were supported on paired bents in regular transverse alignment to the track direction, and therefore the erratic placement of the pilings is not consistent with serving as trestle bent uprights. Instead, the pilings were likely used to stabilize sliding strata in the embankment, a not-uncommon use of pilings and sheet-pilings (cf. Perdonnet 1858:418; Chellis 1961:11). For example, pilings were driven for stabilizing sliding strata in the sea-marsh embankment of the New Orleans and Mobile R.R. on the Gulf coast of Mississippi, as detailed in Marshall (1921). Pilings were driven ca. 1878-1879 on the embankment of that road, in two parallel rows at four-foot intervals. Track repair crews became expert at identifying weak sections of the embankment, and the standard solution was to drive additional pilings between the earlier posts (Marshall 1921:2-4).

The result of driving pilings for stabilization of the banks would have been an irregular spacing of posts within the alignment of the row. Long-time residents of Hollygrove also

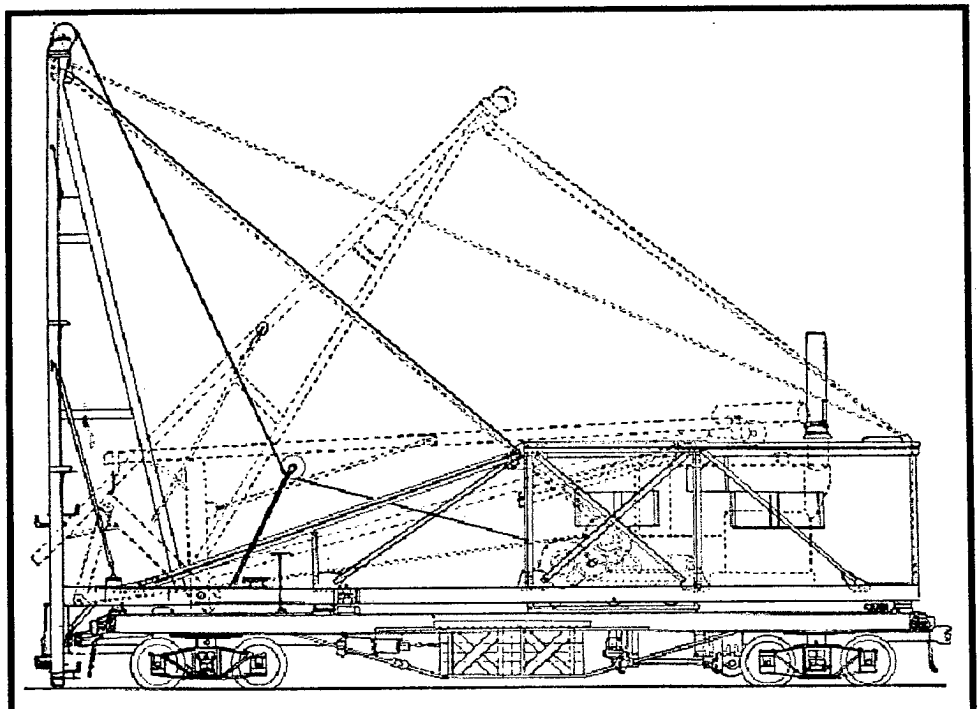


Figure 23. A typical early-twentieth-century, self-propelled railroad pile driver. It could drive pilings within the alignment of the track or on either side of the track (from Crandall and Barnes 1913:172).

understood that the purpose of the pilings in the Illinois Central embankment was to prevent its lateral shifting in the curve, and that they were an addition to the alignment in this area; at least one episode of pile-driving occurred in the current project area about 1930 (Joseph Macaluso, personal communication 1999). The placement of pilings on either side of large horizontal logs within the embankment may have been a result of the impossibility of driving pilings through logs of such dimensions, so that they were simply driven around them. It is possible that either the construction or raising of the bridge over the Upperline Canal and Upper Protection Levee in post-1927 Flood levee improvements required additional stabilization efforts of the embankment in this area. An early-twentieth century railroad pile driver is shown in Figure 23.

Besides constant activity keeping track level, several other maintenance and improvement operations entailed roadbed modifications or disturbance and replacement of ballast. These included replacement of worn, damaged or old rails and ties, correction of "creeping rails" and gauge, etc. The roadbeds of historic rail lines were kept almost obsessively clean while they were in operation, in contrast to some present-day railway rights-of-way, which often seem littered with railroad scrap and trash and choked with weeds. An ideal track policing and maintenance regimen was described by Tratman (1926):

> Grass and weeds in the ballast and along the roadbed are cut and cleared usually twice a year, or oftener if necessary... In the autumn, the grass is cut to sod lines or grass lines, all growth between these lines being dug and removed and kept down until the next season. A cord and stakes are used to set out the grass lines, usually 7 or 8 feet from the rail... This clearing of vegetation from the ballast is necessary for maintaining good track, giving drainage to the ballast, and preventing fires, as well as for appearance. If done by hand, with hoes and shovels, it is slow, laborious, and costly work, especially where the ballast is poor and the growth is heavy. In order to reduce the time, labor, and money expended in weeding track by hand... various devices have been introduced to destroy grass and weeds by spraying them with poison or brine or burning them with flame or steam...
>
> Brush, grass and weeds on the right-of-way must be cut by the section gangs at least once a year, and preferably twice...
>
> ...ditches [must be] cleared, loose sign posts straightened, rubbish picked up and burned, and scrap and spare material properly placed... no material must be piled within 8 ft. of the rail... grass, weeds, brush, and refuse must be kept cleared away from bridges, trestles, culverts, buildings, passenger and freight platforms, road crossings, and piles of cross ties and crossing plank... Dirt and gravel must be removed from bridge seats, and ballast prevented from working over onto bridge abutments or falling into streets below.
>
> The track must also be in good condition and appearance, ballast trimmed and sloped, roadbed shoulders of proper width, rails full bolted and spiked, switches cleaned and oiled, road and farm crossings in good condition, fences in repair...
>
> ...attention should be given to keeping people from walking along the track or using the railway as a public path... [Tratman 1926:310-313].

A remarkable aspect of the excavations for the current project was the almost total absence of historic railway scrap in the trenches (see below). In the past, economy motivated the collection and reuse of scrap:

> In all renewal work and the periodical policing of track, old and scrap material should be collected and carefully saved. Such material as well as that dropped

> from trains or resulting from wrecks should be piled at the station house, the smaller parts in boxes or kegs and the larger parts on a platform outside. Sorting, cleaning small serviceable material, and removing nuts from broken bolts can be done at the section house in stormy weather. Old rails may be sorted for relaying on main or side track or for scrap; all splice bars and bolts should be removed, the good bars being sorted in pairs and good nuts put on good bolts. Old bolts may be oiled to loosen them, and the nuts then removed with a wrench, but if the nut is rusted or wedged tight, the bolt may be cut with a chisel and sledge. Bent spikes may be straightened or turned in as scrap. Brass and copper scrap should be kept in a locked box. Old ties have not much value, but if sold or used for cribbing, all tie-plates and unbroken spikes should be pulled, and when ties are burned, the ashes should be raked to recover the spikes.
>
> Section foremen should see that the men do not throw away bolts, spikes, or tools; even if not usable, they have a value as scrap. Inspection of the scrap by the roadmaster may be a check upon men who are inclined to throw away worn but serviceable material and make requisition for new supplies... All this material is collected monthly by a work train in charge of the store department. Many large railroads have reclamation plants for working over the scrap; bent spikes may be straightened, broken bolts cut to shorter lengths, stub ends of bolts reheaded, nuts retapped, and various supplies remanufactured... [Tratman 1926:314-315].

The lack of artifacts within the Hollygrove railway embankment demonstrates that track policing really was conducted to the extent Tratman recommended.

The historic N.O.J. & G.N.R.R./I.C.R.R. embankment does not remain extant throughout the entire impact area for the currently proposed project improvements. After the track was removed, the embankment was cut down for street crossings on all streets within the current project area, with the exception of streets (such as Monroe) that were already opened before the track was removed. In addition, Colapissa St. between Mistletoe and Hamilton Streets ends in a cul-de-sac on the lake side of the embankment, as it has done since the embankment was built across the squares in this area. The embankment has also been eliminated in several places outside of street rights-of-way, notably: at the corners of Hollygrove and Oleander streets and at Cherry and Fig streets; between Pritchard St. and Monticello St.; and between Monticello St. and the Upperline Canal. After completion of the new Union Terminal in 1954, the Illinois Central line in the project area was largely out of use, and the tracks were removed in the mid-1960s.

Construction Labor and Maintenance Crews

Railway construction in the antebellum period was particularly labor-intensive, and in many parts of the country finding a sufficient number of laborers was a considerable problem. The contract labor force building the 700-mile Illinois Central trunk line in the first half of the 1850s reached 10,000 men, while other railroads were being built in Illinois at the same time. Shortages of construction in the midwest were so severe in 1853 that attempts were even made by the Illinois Central to recruit workers in New Orleans for construction work in Illinois. In Louisiana, as elsewhere, newly arrived immigrants, landless and eager to work, constituted the largest pool of railway construction laborers. This was despite a widespread feeling among Southerners that in terms of efficiency and cost, slaves were superior to hired laborers for the task of building railways. However, slave owners were reluctant to lease slaves to drainage and railroad contractors because of high mortality rates in unhealthy swamp conditions. Irishmen poured into New Orleans by the thousands annually and usually made up a large portion of the laborers in drainage and railway work. It is also likely that German immigrants made up a significant percentage of the labor force. In some areas, railway contractors drew exclusively

from one nationality or the other. Tension between Irish and German crews sometimes boiled over in violence, especially if alcohol was involved, and Irishmen from different regions of the Old Country were even known to fight among themselves (Niehaus 1965:47; Lightner 1977:16-53, 56; Wade 1964:37; Ward 1994:6).

Since the contractors for the embankment within the current project area were themselves Irishmen, it is likely that their crews were largely Irish also. The specific conditions under which the Jackson Road workers labored are not known. If those conditions were typical of what railroad construction labor experienced elsewhere, the work was arduous, the environment demanding, and living standards miserable. N.J. Bell recalled from his youth as a railroad construction laborer: "the work was very heavy for a boy and the weather hot... All the other hands were stout men" (Ward 1994:6). Wages for white laborers were probably about $1 to $1.25 per 10- to 12½-hour day, six days per week, or around $30 to $35 per month. Wages were generally comparable to manual labor in the northern states. If work was halted or postponed because of bad weather, shortage of materials, or other reasons, any contractors' responsibility to the laborers simply ceased to exist. Safety considerations were less important than speed of work, and laborers were injured often. Sick or injured workers unable to work were stricken from the payroll without compensation. Beside the usual difficulties and danger of the work, the cost of living in south Louisiana was high for several reasons. Some railroad contractors in this period erected some sort of shanty boarding camp and supplied scant food provisions. Others left housing and supply considerations to private profit-seeking entrepreneurs, who supplied rough housing, food, and whiskey at inflated prices to the isolated work crews (Lightner 1977:38-39). Thomas C. Bates & Co., contractors for miles 1-3 of the Jackson Road, constructed "sheds" for their laborers before breaking ground on the New Orleans, Opelousas, and Great Western Railroad grade in 1853. Bates used the same workers on both projects (*Daily Picayune* 1853a, 1853b). Sometimes living arrangements were left to the laborers themselves. Bell remembered: "we carried and cooked our rations, and camped on the roadside wherever night overtook us" (Ward 1994:6), and Frederick Law Olmsted observed track-layers camping in tents along an uncompleted rail line during his 1853-1854 travels in the south (Alvarez 1977:160). If the workers lived nearby during construction in the current project area, their lodgings might have been in poorly drained locations, or they may in fact have been able to camp near the line only if water levels were low.

Health conditions for the Jackson Road workers in the south Louisiana wetlands were particularly severe. Sunstroke and heat exhaustion were major dangers for the unacclimated immigrant laboring in the south Louisiana environment (Thornburgh 1950:55). Immigrants were also especially susceptible to epidemic diseases such as yellow fever and cholera, and mortality rates for Irish immigrants from disease were nearly unbelievable. During the 1853 yellow fever epidemic, over 20% of *all* Irish immigrants in New Orleans died, and the death rate among the swamp-bound railway workers could have been higher. Hot weather brought on food spoilage, contaminated or inadequate water supplies, and other health and hygiene problems. In crowded and unsanitary living conditions, dysentery and cholera could wreak deadly havoc. One antebellum commentator reported that the Irish railway laborers "sleep five in a bed, and drink very harmoniously out of the same jug" (quoted in Lightner 1977:31). Meanwhile, medical bills were exorbitant for the common laborer if help was sought for illnesses. For the most part, the immigrant laborers had only whiskey and the ministrations of a few conscientious clergymen to comfort them (Niehaus 1965:47; Lightner 1977:1-53). The pathos of an 1860s ballad, *Mick Upon the Railroad*, came from the genuine Irish railway laborers' song that inspired it:

> *When I lay me down to sleep*
> *The ugly bugs around me creep*
> *Bad luck to the wink that I can sleep,*
> *While workin' on the railroad.*

When I rises on Monday Morn, I hear the sound of the damned owld horn,
I curse the hour that I was born,
To work upon the railroad.
The railroad, the railroad,
The divil take the railroad.

[Cohen 1981:551, *sic* throughout].

London Times correspondent W.H. Russell commented at the end of the antebellum period: "Heaven knows how many poor Hibernians have been consumed and buried in these Louisiana swamps, leaving their earnings to the dramshop keeper and the contractor" (quoted in Shugg 1939:94).

After the road was constructed and track laid, track workers were divided into two general categories, section gangs and extra gangs. Section gangs were formed by the railroad and assigned a section of the line (usually 9 miles) and performed all regular maintenance tasks, such as tightening spikes, replacing ties, and leveling ballast. They were usually more or less long-term employees of the railroad. Extra gangs (or "gandy dancers") were laborers brought in on work trains and performing seasonal or periodic tasks such as distributing ballast or clearing ditches; they were the original "hoboes" (Tratman 1926:237-257).

During the antebellum period, section gang and extra gang workers could be free persons, leased slaves, or even slaves owned by the railroad. In the mid-1850s, New Orleans railroads were hiring "gangs of five or more" slaves up to groups of around 100 men from local slaveholders. In the late 1850s, the use of free labor on southern railroads declined as the practice of using slave labor increased. A New Orleans newspaper in 1858 reported that "Negro labor is fast taking the place of white labor in the construction of southern railroads" (quoted in Stampp 1956:62). Englishman Richard Cobden rode the "New Orleans and Cairo Railroad," actually the N.O.J. & G.N.R.R., in 1859 and learned that the line hired slaves from local planters at $12 per month each to do track work. The railroad also employed skilled African-American mechanics earning as much as $400 or $500 per year. By 1860, the southern railroads owned slave workforces numbering from a few dozen persons to hundreds of individuals, but they rarely owned large enough numbers of slaves to meet the labor demands of construction. Many firemen on antebellum southern railroads were African-Americans; along with slave engineers in sugar mills, steamboats, cotton gins and presses, and elsewhere, locomotive firemen were among the most technically trained African-Americans in the south (Alvarez 1974:40-41; Wade 1964:37, 44; Ward 1994:xv).

After the Civil War, the N.O.J. & G.N.R.R. and its successor entities had great financial difficulties. Under McComb's direction, maintenance of the line was neglected. The consequences for track workers is not known in any detail, but they were likely too few men with too little opportunity and material to perform a thorough regimen of maintenance and repair. Nationally, railroad wages languished in the post-Civil War decades as even the best-managed lines sought to cut corners. Despite some experimentation with various immigrant laborers, principally Chinese and Italians, a substantial proportion (if not most) of the track workers on the southern roads in the post-Civil War period were African-Americans, and this remained the case into the twentieth century. James C. Clarke, who undertook the upgrading of the Jackson Road in the 1870s, believed that there was "no better laborer than the negro to be found among any race in the world... they should be justly dealt with and treated with the respect due all honest laborers." However, Clarke reflected some of the prejudices of his time and felt that African-Americans were "peculiarly fitted for labor in semi-tropical climates, and [are] by nature cheerful, obedient, kind, imitative, and contented" (quoted in Lightner 1977:227).

The Illinois Central Railroad effectively restricted African-Americans to such jobs as section gang worker, fireman, brakeman, or shop laborer, without the possibility of them becom-

Figure 24. A railroad gang at work, 1944 (from Lomax 1993:216).

ing engineers, conductors, or skilled shop tradesmen (Lightner 1977:226-229). This situation remained well into the twentieth century. Despite the considerable skill required to be an efficient track worker, depression of wages contributed to a conception that they were unskilled. Even with the increasing specialization and complexity of railway machinery, low wages and the mobility of experienced track men produced a heavy turnover, typical of most railroad section gangs well into the twentieth century (Van Auken 1916:11-29; Tratman 1926:37-57; Cotrell 1940:32, 50). The turnover of extra gangs was heaviest: the men who did "major repairs...will be recruited locally and seasonally...to return to Hobohemia for the winter" (Cotrell 1940:50).

The railroad section gangs (Figure 24) developed a unique subculture. Many observers were captivated by their work songs, which helped the men wield their hand tools in controlled unison. Bill Broonzy was a section gang member on the Illinois Central in the period 1912-1915:

> I remember when I was working on the railroad... I was in the gang called the 'lining gang'. There was eight of us and we all had bars. The bars was six and a half feet long. We called them lining bars and John Estes would do the calling for us to line track every morning.
>
> When he would call us to start work, this was his words:
>
> '*Every morning every motherchild grab a bar and follow me.*'
>
> Most of the time we would have to walk a half mile to where we worked from our gang cars where we eat and sleep at.
>
> John Estes would sing all the way and when we would get to the place where we had to work at, John Estes would holler:

'*Gang around me, boys, like flies around sugar.*'

And we would and then he would yell:

'*All men to their places like horses to their traces.*'

That meant to put your bar under the rail and he would yell out to us:

'*Is every motherchild got a hold? If not get one and a good one.*'

There was a white man about a hundred feet ahead of us showing John Estes which way he wanted the track to move and John Estes would sing it to us and we moved the track...

That's all that John Estes was doing... sing for us to work by. Everything we was doing during the day was by John Estes' singing. If we wanted to go to the toilet during work time we would tell John Estes and he would sing it to the boss. When he would get the sign from the boss he would sing to us:

'*Everybody lay their bar down, it's one to go.*'

Of course there was no toilet, we just stooped behind a bush or a tree, and when the one that went off comes back he would holler:

'*All men to their places like horses to their traces.*'

...we... stopped to let a train pass. The boss always stopped us from work about ten minutes before the train got to us, so we could get all the bars out the track and he would tell us to stand back from the track...

...it's time to go home... So we put the hand car on the track and all of us went home together... John Estes started a song and we all joined in and helped him to sing until we got to our gang cars...[Broonzy 1964:108-111, *sic* throughout].

Each task of the section gang had its own distinctive rhythmic chant, as explained by section caller Houston Bacon:

...You got four men on one end of the rail and four men on the other, handling that steel with dogs, meaning great big pinchers.

I holler "Get your dogs on it" and the men catch hold the rail. Then I holler "raise up" and the whole gang snatches the rail up off the ties. "Jump i'on [iron]"— we jumps it four to six feet until the steel is right on the end of the tie plate. Then you "jinte [joint] i'on"— it fits right on in a slot between the buckles. And when it jintes, it rings.

Dogs on it!
Loaded so.
Raise up all along.
Jump i'on! Blang!
Nod his head, Shorty.
Way up yonder.
Why don't you straighten that rail there?

Straighten it up, Shorty, like you done last night.
You know how you done it last night.
You gonna fumble at the hole thataway?
I know good and well you didn't do that last night.
Jinte it on back there, Shorty.
Jine hard! Blang!

Four men on each end. And when I say "Jump i'on," they snatch it up and jump it along about six feet. They's one man back there guides it when its head is cocked up in the air. When I tell him "Nod its head, Shorty," he moves the head of the rail down so we can fit it right in the hole. Then you say "Jinte i'on" and we slam them rails together and moves right on down and git the next one... [Lomax 1993:177-178, *sic* throughout].

The veteran section gang could make microadjustments to rails weighing over half a ton while the caller drew from a vast store of nonsense, chanted in the proper cadence:

...now we get ready to line the track up straight. I do the callin and my gang do just what I tell um. They pull to my singin.

O Lu-lu-lu
I'm gonna tell you all about it now.
My wife
*Lou*isa
In bed
With a fe*ver*
So bad
Hate to leave *her*

FOREMAN: Whoa-up! Half ahead there.

CALLER: How you like that?
F: Come up a quarter.
C: How's that?
F: All right.

Well if you can't rap with them linin' bars,
Well, don't stop inside them shanty cars.
Ho, *boys, way over,*
Ho, *boys, way over.*
Whoa-up, move up in center now.
How's that?
Back up two irons. That's right.
Hit it hard.

Take a mule
And a track *jack*
For to line
This track *back.*
Hey, get up in the quarter there.
Ain't got a quarter, give you fifty cents.

Lawd, Lawd, Lawd, Lawd.
What the old lady say when the meat give out?
Settin in the corner with her mouth poked out.

Here, Ring.
Catch a rab*bit*,
Here, Ring.
Catch a rab*bit*,
Whoa-up. Now go in the quarter and hit it.
Just one more pull now.

Lawd, Lawd, Lawd, Lawd.
Uncle Bud got geese, Uncle Bud got ducks,
Uncle Bud got gals that really can ****.

Light
Tech *it*
Bare*ly*
Stretch *it*
Light
Tech *it*
Bare*ly*
Stretch *it*

[Lomax 1993:178-179, *sic* throughout].

Joseph Macaluso watched the Illinois Central section gangs at work on the Hollygrove embankment many times while he was growing up. Having seen something of the world, Macaluso sums up the work of the railroad track men: "it was amazing" (Joseph Macaluso, personal communication 1999).

CHAPTER 6
PREVIOUS ARCHEOLOGICAL AND HISTORICAL INVESTIGATIONS

This section reviews results of previous archeological investigations in Orleans Parish. In addition to archeological monitoring for floodwall construction, excavations have been undertaken at several significant historic sites. Following a brief discussion of the floodwall investigations are detailed descriptions of more extensive excavations. Finally, information on the Friedrich House, the only site located within one mile of the study area, is presented.

Floodwall Surveys

Sternberg and Shenkel (1976) examined two alternate routes for a floodwall between Canal and Toulouse streets. Shenkel concluded that neither route would adversely impact historic buildings in the area. One alternate ("A"), crossed an area paved with granite blocks circa 1898. Shenkel recommended that, if this route were chosen, the blocks be carefully removed and deposited with the appropriate city agency (Sternberg and Shenkel 1976:3). Shenkel (nd) also monitored a pre-construction trench for the Thalia to Poydras Street Floodwall. Cultural debris was found throughout, but no intact midden was encountered. Shenkel concluded that the planned construction would not adversely impact significant archeological deposits.

In 1985, Goodwin and Associates, Inc., developed a research design and data recovery plan for floodwall alignments in New Orleans (Goodwin et al. 1985). The four floodwall alignments would cross 13 city blocks which contained historic structures and/or possessed the potential for significant archeological deposits (Goodwin et al. 1985:95). The alignments discussed were: Jackson Avenue to Thalia Street, Barracks Street to Montegut Street, Montegut Street to Independence Street, and Independence Street to the Inner Harbor Navigation Canal. The report included classifications of numerous historic structures located within the alignments and recommendations on their potential NRHP eligibility. Structures were classed based on their historic use: residential, commercial, industrial, public, and military (Goodwin et al. 1985:30-66, 75-85). It was determined that due to the long land use tenure of this area of New Orleans, floodwall construction should be monitored to record and document archeological deposits. Based on recommendations made in the 1985 report, Goodwin and Associates, Inc., subsequently monitored the construction of the Independence Street to Inner Harbor Navigation Canal, the Barracks Street to Montegut Street, and the Canal Street to Toulouse Street floodwalls (Goodwin et al. 1986), as well as the construction of the Montegut Street to Independence Street floodwall (Poplin and Goodwin 1988). In 1992, the Museum of Geoscience, Louisiana State University, monitored construction of the St. Peter Street Floodgate (Jones and Franks 1992).

The Jazz Complex and Beauregard (Congo) Square

The project area was within Faubourg Tremé immediately adjacent to the Vieux Carré, and was bounded by North Rampart, St. Philip, North Villere, and Orleans Avenue and St. Peters Streets. That square houses the New Orleans Municipal Auditorium and Louis Armstrong Park. Two specific sub-areas were the focus of archeological investigations. Area 2, Beauregard (Congo) Square, was the suspected site of Fort St. Ferdinand, associated with the French and Spanish defensive perimeters that circled the old city. Since the forts removal after 1803, Area 2 has served as a public park and was the site of nineteenth-century Sunday afternoon gatherings by urban slaves. In addition to the two areas that were the focus of intensive fieldwork, a trash pit, a well, and two privies in the 800 and 900 blocks of North Rampart Street were excavated. Units measured 5' x 5' and were excavated in 0.5' levels (Shenkel et al. n.d.:1-4).

A series of test pits and of backhoe trenches were excavated within old Congo Square. In one of these, at a depth of 3.1' and extending to a depth of 10', was a concentration of bricks

associated with a row of vertical cypress planks that appeared to have been driven into place. A row of three upright posts or beams was also associated with the brick concentration. Artifacts in the trench were predominantly dated to the late-eighteenth and early-nineteenth centuries, with the exception of a lens that yielded large amounts of ironstone. The brick and board feature apparently represents the remains of a board-lined ditch and brick bridge known to have been part of Fort San Fernando. Those remains provided a basis for interpretations of construction sequences in the late-eighteenth century. Strata in most other units and trenches in this area indicated that it was severely disturbed (Shenkel et al. n.d.:101-123).

The vicinity of the Jazz Complex was investigated in order to obtain data related to cultural activity during the several historic periods when the Faubourg Tremé served primarily as a residential community. The remains of a spring house measuring 10.2 x 8.0 ft were encountered at 0.2 ft below surface. Apparently the original flooring of the spring house consisted of a 0.5 ft thick layer of oyster shell. Although some creamware and pearlware were recovered from inside the structure, artifacts from the interior derived primarily from the late-nineteenth or early-twentieth century. The soft red bricks used in the foundation suggested construction prior to 1840. Excavations at the exterior of the structure yielded far more artifacts, including a much higher proportion of creamware and pearlware than was obtained from the interior fill. This supports the hypothesized construction date, and it indicates that the interior was periodically cleaned out, whereas the exterior was a locale for fairly concentrated refuse disposal (Shenkel et al. n.d.:123-143).

In an area near a firehouse, a wood-lined privy and part of a fence were uncovered. The fence line was interpreted as the eastern edge of a wood-lined, open trash pit, into which the later privy intruded. Over 10,000 artifacts, of which over 3500 were ceramic sherds, were recovered from units placed to investigate these features. The date range of recovered artifacts, including creamware, pearlware, coarse earthenwares, and ironstone suggested a date of ca. 1820 to 1870 for the features (Shenkel et al. n.d.:143-155).

At the St. Philip Street locale, two units contained the bottom segments of shallow privies, the tops of which had been removed by landscaping activity. Both were apparently associated with a single residence. Artifacts were predominantly from the early-nineteenth century, suggesting that this might have represented one of the earliest residential sites in the faubourg. A fire well, consisting of a hollow circular column of bricks with a diameter of 5.2 ft and a depth of 10.0 ft, was excavated at a locale near 827 N. Rampart St. Although well water was not drinkable, an eighteenth-century ordinance required their presence in case of fire. Creamware (17 percent), pearlware (44 percent), and ironstone (18 percent) were the predominant wares suggesting that the well had been infilled during the early- to middle-nineteenth century (Shenkel et al. n.d.:144-161).

Features and artifacts representing late-eighteenth- to late-nineteenth-century occupations were present at the various sites. The number of artifacts, and the fact that many derived from described and dated features, make this an important comparative collection. However, the reported ceramic analysis is somewhat idiosyncratic, so before comparisons with other sites can be made, re-analysis should be undertaken.

Gallier House Complex (16OR46)

The Gallier House site (1132 Royal Street) and associated warehouse complex (1118-1128 Royal Street) were part of the original Ursuline Convent grounds until the square on which they stand was sold by the Order in 1825. Buildings were constructed beginning in 1833, and the currently-standing Gallier House was built in 1857. Archeological investigations were conducted on the property in 1970 during an extensive renovation program (Hudson n.d.a:1-3).

The Gallier property was enclosed by house and garden walls in 1857. Artifacts were expected to derive primarily from pre-existing, nearby structures, because in 1857 most of the grounds had been sealed under a flagstone walk or they were used as part of a grass plot with a fountain. Grounds associated with the Gallier House proper had been disturbed by construction of a swimming pool and subsequent deliberate infilling, by construction of a cistern base, and by various other construction episodes. The result was an absence of observable stratigraphy necessitating interpretations based only on recovered artifacts (Hudson n.d.a:5-7).

One sherd of tin-enameled earthenware was recovered. All other ceramics were produced in the nineteenth or early-twentieth centuries. These included pearlware, whiteware, and stoneware. The manufacture of at least some of these sherds probably pre-dated the 1857 construction, and all of them could have derived from earlier occupations of the square. Glass sherds were also recovered, and these included eleven identifiable seals. The servants' privy, constructed at the same time as the house, yielded only late-nineteenth-century artifacts. This indicates that the privy contents had been periodically removed during its period of use. The privy was a rectangular brick structure measuring 27" x 51", and was 62" deep. The top and interior were covered with mortar. The interior contained two cypress floors, one at a depth of 42" below the top course of bricks and the second at 52". Two hair tonic bottles, one hair dye bottle, and one perfume bottle were recovered from the privy fill, as well as wine bottles, table glass sherds, window glass, and one optical lens. An 1899 five-cent piece also derived from the privy, while three other coins recovered from the grounds were dated 1773, 1799, and 1833. The main house was served by an interior patent water closet that discharged into an underground sink five ft in diameter and seven feet deep. This feature had been destroyed by swimming pool construction (Hudson n.d.a:7-37).

One small area within the courtyard yielded 131 gunflints, suggesting a cache of unknown purpose and date. Only one black English flint was recovered. The others were honey-colored French flints. Toys recovered from the site included seven porcelain doll fragments, a toy porcelain animal fragment, a toy porcelain lid from a child's table service, and part of a lead horse. Most of these toys were manufactured during the late-nineteenth century. Both clay and glass marbles were recovered. Faunal remains were primarily beef, followed in frequency by pork. Some chicken and smaller bird bones were found, as well as two fish vertebrae. Oyster shells were also present (Hudson n.d.a:38-46).

The warehouse adjacent to the Gallier House was built in 1832, and was the first building to stand on its site. Not all of its use is known, except for a 29 year period during which it was leased by mineral water companies, and 34 years during which it was owned by furniture dealers. It was used as a livery stable for less than two years (Hudson n.d.b:1-4).

Excavation revealed that the arcade brick piers rested on 2" thick cypress planks. Short planks had been laid across the base of a maker's trench, and longer planks rested on these and ran the length of that trench. The planks were at the level of the water table and provided the necessary base for the piers and the weight of the arches, which the muck would otherwise have made unstable. Wall footings were stepped and also rested on cypress planks. One trash pit of undetermined size was noted (Hudson n.d.b:4-8, 13).

Several thousand buff-colored stoneware sherds were recovered, some of which bore the mark of M. Piris, a New Orleans manufacturer of soda water, who apparently used the warehouse in the 1840s. In the 1850s, P. Pons, another soda and mineral water dealer, used the warehouse, and some glass bottle fragments were embossed with his name. A series of such dealers used the facility until the 1870s. Other glass artifacts included wine bottle fragments, wine seals, and a cache of 56 light aqua ink bottles. Pontil scars on the latter indicated manufacture at some time

between the 1820s and the 1880s. Pearlware and whiteware were the dominant ceramic types (Hudson n.d.b:13-30).

The Hermann-Grima House (16OR45)

The Hermann-Grima House at 320 St. Louis Street in the Vieux Carré is actually a structural complex that includes a two-story brick mansion, rear courtyard, three-story rear structure that served as a kitchen and work area and servants' quarters, and a smaller two-story brick structure also in the courtyard. The complex was built in 1831 for Samuel Hermann, a wealthy commission merchant. Felix Grima purchased it in 1844 after Hermann's bankruptcy, and the Grima family resided there until 1921. It has since been owned by the SPCA for three years, and by the Christian Women's Exchange (Shenkel 1977:1-3).

Excavations by the University of New Orleans were designed to provide information on the kitchen and parts of the servants' quarters, on the well, on the smaller back-building, on the suspected privies, and on the cisterns. Twenty units of varying size were excavated (Shenkel 1977:1-3).

Results provided important information concerning the function, construction sequence, and design of the two outbuildings. Excavation in the courtyard indicated that the present flagstone paving lies nine inches above an earlier herringbone brick patio. Between the two lies fill consisting of sand, lime, and concrete. Below the brick patio, features were uncovered that pre-date the 1831 structures. These features included a brick foundation and portions of two earlier courtyard pavements, one at 1.25' and the other at 1.75' below present ground surface. The series of pavements separated by fill indicates that residents of the Vieux Carré periodically elevated their occupation surfaces. Most of the eighteenth-century artifacts recovered came from levels below the uppermost herringbone brick patio. One of the pre-1831 features was a wood-lined well, 6.5' in diameter with a depth of 5.25' below present surface. It was apparently filled with architectural rubble and debris and then covered by the herringbone patio at the time of construction of the currently standing structure (Shenkel 1977:3-27).

A second well, this one associated with the 1831 structure, was also excavated. It was 13' deep and lined with bricks laid in a radial pattern. Diameter of the opening was slightly greater than three ft. Fill included late-nineteenth/early-twentieth-century clay marbles and coins, a brass shingle exhibiting Alfred Grima's name, and large amounts of slate and brick debris. The well was apparently filled in during the early-twentieth century. Associated with the well was a rotary hand pump. No privies were located by these or subsequent excavations (Shenkel 1977:27-29).

Ceramics, glass, and nails were the major artifact categories. Creamware accounted for over 58 percent of recovered ceramics, while pearlware constituted only about 20 percent. Other types included tin-enameled earthenwares, jackfield wares, hard-paste porcelain, lead- and salt-glazed coarse earthenwares, refined earthenwares, redwares, black basalt, and stonewares. A total of 6,137 sherds were recovered. Of these, 91.7 percent were manufactured in Britain while 5.3 percent were of French origin. Mixing of ceramics and other artifacts of widely-varying dates in all units was interpreted as evidence of disturbance prior to excavation. Most nails were too badly corroded for identification. Diagnostic glass indicated manufacture dates from 1761 to the early-1800s (Prieto 1977:87-101). A re-analysis of ceramics from these excavations indicates that, contrary to the original interpretation, disturbance was minimal (Yakubik 1990).

During 1982, Tulane University conducted additional excavations at the Hermann-Grima House to mitigate the impact of drainage improvements. Thirteen test units were excavated at various locations adjacent to the house and main outbuilding, and within the courtyard (Davis and Giardino 1983:2-4).

It was suggested that the uppermost herringbone courtyard, because of its relationship to the house and the configuration of brick-lined drains, may have pre-dated the 1831 construction episodes. Wooden dividers consisting of upright stakes were uncovered in some brickless areas. The presence of a series of brick-lined floors beneath the herringbone floor was confirmed. One stratum yielded evidence of an episode of severe burning. Artifacts from the stratum were dated to 1780-1797, suggesting an association with the great fire of either 1788 or 1794. Mean ceramic dates from excavations south of the house ranged from 1831 at Stratum I to 1753 for the wood-lined well located beneath Stratum V. The ceramic and stratigraphic sequence suggested deposits were undisturbed beneath the uppermost herringbone. One unit contained part of a stepped-brick foundation for the house. As was true of the stepped-footings at the Gallier House, the footings at Hermann-Grima rested on cypress boards (Davis and Giardino 1983:19-49).

Of 3,435 artifacts, 56 percent were ceramics, 17 percent were glass, 17 percent were bone, and 10 percent were metal. Ceramic type percentages were almost identical to those reported for the University of New Orleans excavations, with creamware predominating (56 percent) and pearlware (20 percent) occurring with the next highest frequency. Most diagnostic bottle glass sherds were dated to the years between 1790 and 1810. The most commonly recovered faunal remains were cow, pig, and horse, with chicken and turkey bones common but less frequent. The lowest level of one unit yielded one shell-tempered aboriginal sherd and a blue glass trade bead (Davis and Giardino 1983:63-66).

In 1983, the University of New Orleans Archaeological and Cultural Research Program undertook data recovery to mitigate the effects of improvements to the stable complex at 818 St. Louis Street. Six excavation units were placed within the stable yard. One of these revealed two brick features that were interpreted as dating to the eighteenth century. A third brick pier was dated to the late-eighteenth or early-nineteenth century. In addition, four units were placed within the stable annex, but no information on the function of this area was obtained. The final excavation unit was excavated within the residence at 820 St. Louis Street. It was placed below the floor of the first-floor "bathroom" of the house. There was no indication that an excavated privy was ever located in this area, but the unit provided data on the construction of the extant structure (Lamb and Beavers 1983).

Analysis of the cultural material included the presentation of "contextual ranges" and "median dates" for several tin-enameled and coarse earthenware types for the purpose of calculating mean ceramic dates (Lamb and Beavers 1983:51-56). Unfortunately, there are serious problems with the assumptions on which these ranges and dates are based. First, the median dates are derived from "dates of possible importation to North America" on the basis of the occurrence of these types at only four sites outside of Louisiana (Lamb and Beavers 1983:52). In addition to this being a limited examination of the occurrence of these types (cf. Yakubik 1990:Appendix I), it has not been demonstrated that the mid-point of importation is necessarily the modal date of popularity. Conversely, the mid-point of manufacture does appear to reflect the peak of popularity of ceramic types utilized in South's (1972) original formula on the basis of empirical evidence that "it works" (Deetz 1977:18). Finally, the authors' modified formula is applied to undated contexts, so there is no way to judge the validity of the results.

More successful is the typology and chronology for Louisiana bricks developed by Greene (1982) and utilized in this report (Greene 1983). Three types of hand-made bricks (ca. 1720 to ca. 1830) and five types of machine-made bricks (ca. 1820 to present) are presented. The type descriptions are clear, and chronology is based upon measurements on bricks from dated contexts. Similarly, the latter has been successfully tested on dated materials.

Lamb, Beavers, and Greene (1985) returned to the Hermann-Grima House two years later in advance of the re-leveling of the courtyard and the restoration of 1830s-period plantings to the flower beds. Six units were excavated. Data from these units seem to confirm the fact that the

raised beds of the garden date to 1831. Limited excavations were also conducted in the alleyway between the main house and the garden wall for 820 St. Louis (Beavers, Lamb, and Greene 1988). This work permitted examination of features in the front portion of the lot for the first time. A third limited investigation was undertaken in conjunction with the renovation of the wine roon in the kitchen/quarters building. Brick analysis had previously suggested that the adjacent rectangular portion of the "round end annex" was the oldest structural remains on the property. A foundation was uncovered during excavations that predated the extant building, but which were oriented the same way as the rectangular portion of the "round end annex" (Beavers, Lamb, and Greene 1990).

The most recent excavations at the Hermann-Grima House were also conducted by Beavers and Lamb (1993). Investigations concentrated on the ironing room of the kitchen/quarters building and the "mystery building" in a corner of the courtyard. In the latter case, artifacts did not yield any information on the function of the structure, and it was interpreted as a light-duty workshop or storehouse that was likely constructed ca. 1780 based upon brick analysis. Excavations within the ironing room demonstrated that the kitchen/quarters building that had been extant on the property prior to 1831 was smaller than the current building. One of the most interesting uncovered features was a wall drain, presumably for disposal of waste water. In addition, further excavations in the alleyway adjacent to the rectangular portion of the "round end annex" confirmed that this is the earliest structure on the site, and predates 1780 (Beavers and Lamb 1993).

The Site of the U.S. Mint Building (16OR52)

In 1760, defense bastions connected by palisades and a continuous perimeter moat were constructed around the city of New Orleans. The system intersected the Mississippi River near the presently standing U.S. Mint building. In 1792, five pentagonal forts revetted with brick were constructed along the walls and moat. Fort St. Charles stood at 16OR52, and it was not dismantled until the years 1816 to 1821. The property served as a park in honor of General Jackson until 1835 when the U.S. Mint building was erected. Mint officers were allowed to live on the grounds until 1888. During Federal occupation of New Orleans from 1862 to 1877, troops occupied and maintained quarters there. After minting operations ceased in 1909, the structure was occupied by the Veterans Bureau, the U.S. Coast Guard, and the Louisiana State Museum. During renovations in 1931, a brick footing was uncovered, and it was thought to derive from Fort St. Charles (Castille 1978:2-5).

During 1978, the Louisiana Division of Archaeology excavated three test pits on the grounds of the U.S. Mint. The first unit measured 1 x 1 m, and was excavated to a depth of 30 cm. The unit was abandoned when it was determined that it had been placed directly above a sewer line. Soils appeared disturbed to a depth of 30 cm, and artifacts were primarily architectural debris and *Rangia* shells (Castille 1978:6).

A second unit was placed at the edge of the structure facing Esplanade Avenue. The unit measured 1.2 x 2.25 m, and was excavated to a depth of 1.45 m. The only feature encountered was the Mint's stepped brick footing. Tin-enameled earthenware (n=21) and lead-glazed earthenwares (n=8), both characteristic of the eighteenth century, were recovered only below 0.4 m depth. Cream-colored earthenware (n=26) and pearlware (n=41), both of which are late-eighteenth- and early-nineteenth-century wares, were recovered at depths of 0.2 m to 1.2 m. Only two sherds of whiteware were recovered, and these were from levels above 0.3 m. One undescribed aboriginal sherd and two sherds of unglazed coarse earthenware were also recovered. The presence of pearlware in most levels was interpreted as evidence that *in situ* pre-1780 deposits might be present only below 1.5 m, the approximate depth of water table and sterile clay. However, when a posthole digger was used to reach a depth of 2.5 m within the unit, no artifacts were recovered (Castille 1978:6-8 and Figure 3-1).

The third unit was also placed on the Esplanade Avenue side of the building, but this time at a distance of 1.2 m from the exterior wall. It measured 1.1 x 1.2 m and was excavated to a depth of 1.45 m. Tin-enameled (n=6), unglazed coarse earthenware (n=1), lead-glazed (n=4), and pearlware (n=9) sherds were recovered. A clayey sand termed Zone 6 yielded small fragments of pearlware as well as gunflint fragments. This zone lay below a stratum of brick and mortar rubble. That portion of the stratigraphic sequence suggested a parade-ground succeeded by a building or demolition stage associated with a brick structure (Castille 1978:8-9).

Although no features associated with Fort St. Charles were encountered, further excavations were recommended because of pending terrain alterations on all sides of the U.S. Mint structure (Castille 1978:10). Further work was accomplished by monitoring of mechanical excavation of sewer and utility line trenches that were 1.0 to 2.2 m deep, by hand excavation of trenches to depths of 0.25 to 0.50 m in the basement of the structure, and by mechanical excavation of seventeen six-inch cores to a depth of 2.5 m (Gibbens 1978:6-7).

No evidence of Fort St. Charles was noted. Several brick footings were uncovered. These were interpreted as possible foundations for a coal shed or a covered walkway. Two square cypress timbers beneath the basement floor had probably served as supports for heavy equipment in the boiler room. Portions of a central set of water closets, 13.9 x 3.5 m and formerly located along a portion of the exterior wall, were excavated. These were floored with pine planks at 1.75 m below the top of the structure's foundation. Fill consisted of brick rubble, granite paving stones, and mortar. Few artifacts were present, indicating that the water closets were cleaned out and backfilled with rubble during their 1908 demolition (Gibbens 1978:7-14).

A circular foundation of St. Joe brick in the Flemish bond pattern represented a cistern base with a diameter of 2.5 m and a depth of 0.5 cm. Interior fill yielded early-nineteenth-century transfer-printed pearlware sherds and modern 7-Up bottle fragments. Two circular steatite-lined basins with diameters of 3.05 m were noted. Fill was excavated from one of these, but it yielded only granite paving stones and brick. The spread-foot foundation of the original Mint smokestack was examined. Soft, bright red bricks were laid in the Common bond pattern, and the feature was 2.3 m square and 0.45 m thick. Artifacts included 209 glass sherds, of which 83 represented wine or liquor bottles. A total of 158 ceramic sherds were recovered. These included whiteware (n=79), pearlware (n=38), tin-enameled earthenware (n=17), creamware (n=7), and lead-glazed earthenware (n=7). Fifty-one of 54 recovered bones represented cow (Gibbens 1978:7-14).

Excavations indicated that numerous renovations of the building and grounds have resulted in disturbed stratigraphy and mixing of artifacts. Also, remains of Fort St. Charles probably were removed some time before or during construction of the U.S. Mint building (Gibbens 1978:7-14).

Lots at Esplanade Avenue and Rampart Street (16OR63)

Archeological test excavations were conducted within an area just outside the Vieux Carré. Located at the corner of Esplanade Avenue and North Rampart Street, part of the property was located within the Faubourg Marigny National Historic District and the remainder was within the then-proposed Esplanade Avenue National Historic District. A French bastion dated to the colonial period, and Fort. St. Jean associated with the defensive walls built in the Spanish period, were thought to have been located in the vicinity of the project. By the 1820s, the fort and associated wall had been removed, and subdivision for residential use had begun. The architect Felix Pinson built two houses on the lots, and he sold those structures by 1836. A female Free Person of Color was living on one lot by 1813. Through the 1800s, structures passed through a series of owners, and beginning in 1871, the Ursuline Nuns, followed by the Brothers

of the Sacred Heart, established schools there. One other portion of the property had a different history. It became the site of one of the costliest mansions in New Orleans in 1856. This latter area (Unit 2) was ultimately determined ineligible for the National Register of Historic Places (Castille et al. 1979:2/11, 4/4-4/11).

The Pinson/Ursuline areas, deemed Unit 1, were found eligible for inclusion on the National Register after excavation of eight 1 x 1 m test pits yielded features and large numbers of artifacts from the early-and late-nineteenth-century occupations. Data recovery was recommended and later undertaken on this portion of the property (Castille et al. 1979:5/12-7/1).

Several explicit research objectives were developed to guide further archeological investigations. One goal was further development of a model for urban residential compounds typical of the slave-holding South. Such compounds commonly consist of a main residence, a yard in the rear that often included servants' quarters, a kitchen, store rooms, a stable, and other outbuildings located either to the side or to the rear of the main house. The Pinson two-story townhouse represented such a compound. A nearby property, occupied by Free Persons of Color from the 1850s to ca. 1870 and then occupied by whites of modest means, was expected to provide a contrast to the Pinson compound (Castille et al. 1982:1/3-1/4).

The second major research objective was an examination of manifestations of social and status differences in the archeological record. It was anticipated that status differences would be reflected in architectural remains, material possessions including ceramics, and dietary remains. The third objective was to obtain archeological data pertaining to material and spatial aspects of urban slavery. Finally, research was designed to depict involvement of residents in local, regional, national, and international economic spheres (Castille et al. 1982:1/6-1/7).

On the Pinson lot, 71 m^2, or approximately one percent of the total surface area, were excavated by hand and 15 m^2 were opened by backhoe. On the other lot 54 m^2 (1.4 percent of the total area) were excavated by hand and 3 m^2 by backhoe. Over 50,000 artifacts were recovered, of which over 25,000 derived from features. The latter group was analyzed. The 23 recovered features consisted of six brick foundations, three trash pits or piles, three demolition or pipe excavation disturbances, two artifact concentrations, two brick-lined wells, three brick walkway or patio remnants, three brick-lined pits, and two pits or depressions (Castille et al. 1982:1/8,4/5-4/6).

For analysis of artifacts, South's (1977) nine functional groups were used: (1) kitchen; (2) bone; (3) architecture; (4) furniture; (5) arms; (6) clothing; (7) personal; (8) tobacco; and (9) activities. Two additional functional groups were devised to accommodate artifacts not considered by South: (10) miscellaneous; and (11) structural debris for bricks, slate, and other rubble types not included in architecture by South. Finally, the kitchen group as defined by South was modified to accommodate late-nineteenth- and early-twentieth-century material such as tin cans (Castille et al. 1982:5/1-5/8).

Miller's (1980) pricing study of late-eighteenth- to mid-nineteenth-century earthenware ceramics was used to examine status differences between occupations. Miller classified ceramics into four groups to which he assigned numerical status indices. These are, in increasing status order: (1) undecorated; (2) edge, sponge, banded, mocha, and finger trailed slip decorations; (3) hand-painted; and (4) transfer-printed and ironstone. Some additions were made to Miller's four groups in order to accommodate common late-nineteenth-century ceramic types. "Ironstone" was defined as a highly vitrified, "opaque porcelain." Also, molded or embossed ceramics were ranked with hand-painted ceramics, and yellowware was added to the edge/banded/mocha category. Finally, lead-glazed utilitarian earthenwares and stoneware were placed with undecorated ceramics in the lowest status (Castille et al. 1982:5/33-5/34).

Data to address the first research objective of the project derived from comparisons of the excavated properties with other nineteenth-century residential compounds. The result was refinement of a model depicting three variations of "middle class" residential units, which apparently, at the time of construction, correspond to differences in socio-economic status. The lowest status compound of the three "middle class" units consists of a main residence, a detached kitchen, a courtyard, privy, cistern, and fire well. The residential structure is often a one-story wooden Creole cottage. Sometimes these were "doubles" shared by two poorer families. Middle status units are characterized by the additional presence of servants' quarters in the same structure as the kitchen. Also, the residence is often larger, sometimes a 1-1/2 story Creole cottage. Such a middle status compound was commonly surrounded by a wooden fence. The highest status "middle class" compound is characterized by an additional building that may have served as a stable/carriage house. Most structures are made of brick. Both the main house and the kitchen/servants' quarters are two stories. A carriage-way may lead into the courtyard. A high brick wall surrounds the compound, and a formal garden may be present in or near the courtyard (Castille et al. 1982:6/1-6/3).

The second research objective of the project, examination of social and status differences, was not met due to site disturbance and due to temporal differences between features on the two lots in which excavations were conducted. One other problem with such an objective may be the admixture of artifacts from the main residence and the servants' quarters of a single high status, walled compound. This problem also makes data collection to address the third objective, depicting spatial and material aspects of urban slavery, particularly difficult. The fourth objective, documenting economic networks, was somewhat successful because of available information on ceramic types and makers' marks and on the French origins of most of the excavated wine bottles (Castille et al. 1982:6/3).

Use of formal/functional groups for comparing artifacts was a successful research strategy for the site. A higher percentage of kitchen-related artifacts was recovered than is true of British patterns defined on the basis of sites on the East Coast. However, the percentages at Esplanade Avenue did approach those termed the "Piedmont Survey Pattern," possibly reflecting low status occupations of the late-nineteenth- and early-twentieth century, or reflecting a change in artifact patterning characteristic of and ongoing during the nineteenth century as a whole (Castille et al. 1982:6/3-6/5). Field investigations and artifact analyses reported for this project were exemplary, and represent an invaluable data base for comparisons with other urban sites both in New Orleans and in other cities.

1984 World Exposition Site

Two separate studies were conducted to evaluate the impact of the 1984 World Exposition on the archeological resources of New Orleans' Central Business District. The area affected by the exposition included blocks within the Harrah's Casino site bounded by Front, Poydras, Girod, and South Peters streets. Investigations at the casino site are discussed in a following section.

Investigations by Heartfield et al. (1982) were designed to supplement Hilary S. Irvin's (1982) standing structure survey of the Exposition area. Shovel testing and excavations were conducted on vacant lots south of South Front Street. These investigations exposed highly compacted and disturbed deposits associated with train yards near the Mississippi River and, "no significant archeological resources were found" (Heartfield et al. 1982:19). Researchers assumed that subsurface disturbance would be no greater than 2.5 ft below ground surface. However, it was noted that there was a strong possibility of deeper deposits existing below this level (Heartfield et al. 1982:19).

Investigations by Beavers (1983) were concentrated along the railroad and wharf areas to the south of South Front Street and to the west of Girod Street. Twenty test units were judgmentally-placed across two lots in an area occupied by warehouses, railroad tracks, and parking lots (Beavers 1983). Test units were excavated to a minimum depth of five ft. Nearly all of the small number of artifacts recovered dated to the middle of the twentieth century and came from the upper 2.5 ft of deposition. However, "it becomes immediately obvious in looking through the unit profiles that up to seven ft of cultural accretion has taken place on the site at the edge nearest the Mississippi River" (Beavers 1983:36). The authors go on to note that the site had been adversely effected by an historic series of construction and destruction episodes" (Beavers 1983:38).

Excavations at 16OR69

It is believed that this site, bounded by Jackson Avenue, St. Thomas, Josephine, and Rousseau Streets was initially the location of a sugar house. That structure was converted for use as an orphanage dormitory. Subsequently, residential structures and then a school were present. Backhoe trenches were used to locate features which were then excavated by hand. Thirty-five features were uncovered, of which the majority were brick footings and foundations. Excavated features also included two cistern foundations and three privies (Goodwin and Yakubik 1982:1-3).

The site was part of a plantation above New Orleans until the 1824 purchase of a lot by the Society for the Relief of Destitute Orphan Boys. The organization repaired an "old brick edifice formerly a sugar house..." on the property in order to house orphan boys. The asylum was abandoned in 1861, and the property was subdivided and sold at auction in 1866. Subsequently, shotgun residences and a school for African-Americans stood on the various lots (Goodwin and Yakubik 1982:4-19).

A series of brick footings were interpreted on the basis of map evidence as the remains of the sugar house/orphanage. Most other brick features were continuous brick foundations associated with later structures. One of the trashpits contained a large concentration of kitchenware and subsistence refuse, and was located near an addition to the orphanage dormitory that may have been a kitchen wing. One of the cistern bases probably was constructed prior to 1860, while the other was slightly later. The excavated privies were dated from 1885 to 1895 (Goodwin and Yakubik 1982:20-30, 97-147).

Artifacts included kitchenware, architectural items, toys, tools, buttons, and a variety of personal possessions. The majority were recovered from the trash pit and from privies, with very few occurring in the immediate vicinity of living areas. This pattern of artifact location is different from models developed for eighteenth-century British sites in the East. It reflects efforts by nineteenth-century urban residents to maintain a relatively clean area around their houses and to dispose of refuse in discrete features or to remove it to some other locale (Goodwin and Yakubik 1982:82).

Ceramic dating indicated that for the late-nineteenth century, mean ceramic dating as proposed by South (1977) should be used with caution because no date so calculated can post-date the latest median date for the types occurring in the sample. Glass artifacts, especially datable manufacture techniques, were used to provide a more realistic chronology for the site and its features (Goodwin and Yakubik:1982:83-96).

A comparison of the dates for glass and ceramic artifacts associated with the orphanage (1825 to 1861) indicated that relict ceramic use was occurring in that institution. Mean Ceramic Dates from specific features were considerably earlier than bracketed glass dates for the same features. This was not true for later residential occupations on the site. Ceramics were also

divided into hollowware, flatware, and miscellaneous categories. The analysis indicated that occupants of the orphanage used relatively greater proportions of hollowware than did the later residents of shotgun houses. However, frequencies of hollowware were higher than those recorded by Otto's (1977) studies of an "upper-class" planter and a "lower middle-class" overseer, indicating that both occupants of the orphanage and the subsequent residents were all of "lower class status." Burned bone was rare at the site, suggesting that roasting meat was an uncommon practice. This, and the high frequency of hollowwares is evidence for a diet high in soups and stews. Finally, use of Miller's (1980) price ranking analysis, discussed at greater length below, indicated that a greater proportion of expensive ceramic types were used by the late-nineteenth-century residents than was true for the occupants of the orphanage (Goodwin and Yakubik 1982:180-187).

Unlike the investigations reported in the section immediately below, neither ethnic identities nor occupational status of the post-orphanage residents of 16OR69 were obtained at the time of excavations and the subsequent report. However, these data could be easily obtained should the curated collection be relevant for comparisons with other New Orleans sites.

Algiers Point

Archeological data recovery of several city blocks scheduled for impact by a levee setback was conducted at Algiers Point. Prior to field work, an archival overview (Fritz and Reeves 1983) was prepared (Goodwin et al. 1984:12). Field methods applied at Algiers Point were primarily excavation of backhoe trenches of variable length and depth supplemented by hand excavations of features. Excavations were located within squares that, on the basis of archival research, were considered to be high probability locations for intact historic period archeological deposits (Goodwin et al. 1984:137-139).

Fifteen features and three refuse deposits were uncovered in Square 21. One of these was a ferrous zone associated with Johnson Iron Works, the location of which is shown on a 1909 Sanborn map. Wooden planking above an L-shaped brick foundation was also excavated. Excavations within Square 21 also yielded cultural material associated with residential occupations (Goodwin et al. 1984:137-139).

Features within Square 13 were primarily brick walls and smaller brick foundations. Some of these were associated with a slate-roofed residence that was standing during the 1880s. Others were associated with Johnson Iron Works and included foundations to support machinery. Two refuse lenses associated with antebellum and postbellum residential activity were also uncovered. Square 10 contained the remains of a blacksmith concern as well as three tenant residences shown on the 1903 Sanborn map (Goodwin et al. 1984:139-140).

Analysis of cultural material included calculation of mean ceramic dates and bracketed glass dates for all excavated proveniences. All of the obtained dates were within the nineteenth century, and were primarily post-1850. Earlier dates were generally associated with smaller sample sizes, many of which were so small that they may be unreliable (Goodwin et al. 1984:169-172).

Unfortunately, deficiencies in the documentary and archival records limited the utility of analysis of artifacts aimed at differentiating status of the various occupants. Often, artifacts were recovered that pre-dated periods for which archival information had been obtained. This was the case for cultural material associated with residential occupations within Square 21 (above). However, sufficient archival information was obtained for interpretations and comparisons of residential debris excavated from Square 13. Material there could be assigned to a church and clerical residence (1849-1872) and a subsequent mixed residential-commercial occupation by a "middle class" mortician and furniture-maker. Also, some material was obtained from Square 13 that could be assigned to a "working-class" occupation (Goodwin et al. 1984:179).

South's (1977) functional classes of artifacts were used for data analysis with two major modifications. First, because of low frequencies of occurrence, the categories of clothing, tobacco, and toys were included in the category for personal items. Second, South's kitchen category was modified in that glass and ceramics were considered separately.

When artifacts from privy fill were compared for the "middle class" and "working-class" occupations, significant differences were noted. The "middle-class" privy yielded more glass, architectural material, and personal artifacts, but it contained fewer ceramics. The greater than expected frequency of architectural material was attributed to demolition of the church that formerly occupied the lot. However, the high frequency of glass and personal artifacts was interpreted as a reflection of a higher status occupation. Miller's (1980) price ranking of ceramics was also used to compare the "middle class" and "working class" occupations. Following Miller, porcelain was excluded from the analysis. Due to low frequencies of occurrence, Miller's second and third levels were combined. The comparison did show a significant difference between the two ceramic assemblages. One additional comparison, this time between the "working-class" resident and a nearby "tenant" produced similar results. Statistical testing did not support the hypothesis that higher status occupations yield a higher frequency of personal artifacts than do lower status occupations. Similarly a comparison to detect the presence of relict ceramics in assemblages associated with lower status occupations yielded negative results (Goodwin et al. 1984:179-195).

St. Peter Street Cemetery

In the spring of 1984, construction workers came across the remains of the first cemeteries in New Orleans in the block bounded by Toulouse, Burgundy, St. Peter, and North Rampart Streets. Salvage archeology was conducted by Louisiana State University (Owsley et al. 1984) who focused on examining the areas directly impacted and therefore destroyed by construction. Thirty-two burials were excavated, along with their accompanying coffins, some grave goods, and surrounding artifacts. This study represents the first archeological examination of the remains of Louisiana's eighteenth-century population (Owsley et al. 1984:1-12).

The St. Peter Street Cemetery was the main cemetery for New Orleans from its founding in the early-1720s to the establishment of the St. Louis I cemetery in 1789. The St. Peter Street Cemetery was below ground and was closed when it became too full to inter any more bodies. The cemetery may have been utilized as late as 1801.

The coffins were tapered and made of cypress. The burials were oriented parallel to St. Peter Street, usually with the head to the northwest. Only three objects were found within the coffins: a rosary, a religious medallion, and a bone button back, although pollen grains indicate that flowers were likely placed inside one coffin. Most of the findings relate to the physical condition of the skeletal remains. Of the thirty-two burials that were excavated, there were two children, one infant, 26 adults (over 15 years old), and three burials with no bones preserved. These individuals were of both African and European ancestry. The adult burials suggest a higher mortality for young females. One striking condition of the bones was the pronounced robustness and bone hypertrophy caused by heavy physical labor and strain (Owsley et al. 1984:162-165).

The Greater New Orleans Bridge No. 2 Right-of-Way

The most extensive and best-reported archeological investigations in urban New Orleans to date were undertaken in the Lower Garden District, within the right-of-way of the Greater New Orleans Bridge No. 2. The project area lay along an axis stretching from the foot of Thalia Street at the river to the bed of the former New Basin Canal near Claiborne Avenue, encompass-

ing at least 56 squares. Pursuant to the Scope of Services, no intensive survey was undertaken. Rather, 24 properties that had been found to have architectural significance were defined as the focus of archeological investigations. The properties included a cotton press, a cotton mill, residences, warehouses, stores, a church, and miscellaneous other structures. Actual archeological testing was undertaken on 14 of the 56 squares, each of which contained an average of about 12 properties. Thus, only a few properties on each square could be investigated. Ultimately only about one-half of the architecturally significant properties were investigated, but excavations were conducted at replacement sites defined on the basis of testing. Both backhoes and hand excavation units were used in the course of these investigations. Fieldwork lasted about four months. A total of 9,200 person hours were expended in the field and 16,000 additional hours were expended during artifact analyses and report preparation (Castille et al. 1986:1/1-1/6).

Notarial records, census records, and city directories were used to identify mid-nineteenth-century residents of targeted properties. The project research design outlined several objectives. The first was to examine the structure and variability of the urban residential unit based on the model previously proposed by Castille et al. (1982 and above). The second objective was an examination of social, ethnic, economic, and status variability. One aspect of this was to obtain comparative data from nineteenth-century occupations by German and Irish immigrants, as well as from non-immigrant "middle and upper class" residents. The third research objective was to examine the commercial and industrial setting of the project area. One aspect of this objective was an examination of nineteenth-century use of the accreting batture located here (Castille et al. 1986:1/9-2/7).

For artifact analyses, South's (1977) functional classification was abandoned because his typology appears to include a mixture of both functional and descriptive criteria and because some of his artifact classes represent several unrelated activities. A new functional classification was, therefore, devised in an attempt to compare artifacts on the basis of presumed function. Where previously established descriptive criteria provide relevant data, such as chronological information derived from glass and ceramics, these were also used for analysis. The desired result was added flexibility during analysis so that an appropriate classificatory system could be used to address specific research problems (Castille et al. 1986:2/6-2/7).

Table 2-1 in Castille et al. (1986:2/8-2/10) should be consulted for detailed information regarding functional categories used in this study. These are only briefly outlined in the present discussion. The Domestic Group includes artifacts that would have been kept in the house and used for subsistence and comfort. The two major components are a kitchen class and a household furnishing class. The Personal Group includes portable items that would have been carried or worn by an individual. The Health and Hygiene group includes two major classes, artifacts related to medicine and artifacts related to sanitation. The Architecture Group included three artifact classes: construction, hardware, and utilities. The Economic Activities Group includes four classes: industrial, handicraft, commercial services, and transportation. The Services Group encompasses military artifacts and artifacts related to public services. The Ritual Group includes religious and fraternal artifacts. Finally, an Unclassified Group includes miscellaneous fragments of metal, glass, ceramics, and other artifacts the function of which could not be determined (Castille et al. 1986:2/7-2/12).

Ceramics, glass, buttons, and coins were used to date all excavated features. Status was examined through comparisons of the relative percentages of ceramic types, faunal remains, alcoholic beverage containers, and tobacco pipes. Miller's (1980) pricing categories, as modified for the Esplanade Avenue excavations (Castille et al. 1982 and above) were an important component of investigations related to status. Vessel forms were also used. Occurrences of wine seals and of tobacco pipe fragments were used to address status, and it was believed that the latter artifacts might reflect ethnicity as well (Castille et al. 1986:2/14-2/17).

The project area had been owned first by Bienville, then by the Jesuits, and after 1763, by members of a few French Creole families who were representatives of New Orleans' ruling elite. Subdivision of some areas for residential and commercial use began as early as 1810. By the mid-nineteenth century, much of the area was populated by Irish and German immigrants. Use of the censuses of 1850 and 1860 indicated that most residents of the area worked at jobs near their houses. Coffee houses, bars, and grocery stores were common in the neighborhood. A sample of 1,120 residents included 292 working people with 54 different occupations. The largest category was that of laborer, and included 30 percent of the sampled workers. The other common occupations were clerk, merchant, carpenter, drayman, and steamboatman. Industrial/ commercial facilities in the vicinity included a relatively large number of cotton presses, a sugar refinery, a foundry, and numerous warehouses (Castille et al. 1986:4/1-4/31).

Fieldwork resulted in excavation of 59 backhoe trenches and 110 hand excavation units, together representing 1000 m^3. Features included 23 privy pits, two wells, nine cistern foundations, 74 wall foundations, and 68 pavements, as well as post molds, trash deposits, and artifact lenses. Artifacts were associated with a wagon yard, a tin shop, an ice house, a brick kiln, stores, residential complexes, and other components. It was estimated that two tons of artifacts, representing about 200,000 items, were recovered. In general, the smallest cultural unit was the lot. Most lots, especially those used for residential purposes, maintained the same configuration through the nineteenth and twentieth centuries. Research objectives were refined in the course of excavations, and one square (Square 46) was selected for intensive comparison of remains of Irish and German immigrant occupations and of industrial development. Previous experience in the project corridor indicated that careful exploratory trenching with a backhoe yielded more features. This was confirmed by additional excavations within Square 46 (Castille et al. 1986:5/ 3-5/6). A detailed report of excavations by square and by lot, and of artifact analyses for each excavation unit and/or feature, were included in the report (Castille et al. 1986:6/1-6/518) which is, and may remain, the single most important source for information concerning nineteenth-century archeological deposits in New Orleans.

The largest number of artifacts derived from privy fill. The densest concentrations of artifacts within privies generally occurred either in a thin zone at the top or at the base. This suggested that artifact deposits in privies usually were the result of a single, temporally restricted event rather than a slow accumulation over the use life of the pit. It is possible that this pattern of deposition is related to transitional periods in site occupancy, such as when a family moved in or out of the associated house, or when a dependency is cleaned out. Also, the contents of privies in New Orleans were periodically removed for sanitation and hygiene reasons (Castille et al. 1986:7/1-7/4).

In an effort to assess the utility of the Functional Group classification system proposed and used, 24 major proveniences representing 19 features were examined. These proveniences yielded the largest concentrations of *in situ* artifacts, and represented properties for which the occupants could be identified. Site function for these properties was classified as either residential, craft (a residence with an associated cottage industry), or store (combination residence and retail outlet in the same building). Functional groups of artifacts were compared. For the 24 proveniences as a whole, artifact functional group frequencies in descending order were Architecture Group (35 percent), Domestic Group (31 percent), and Personal Group (30 percent). The Health and Hygiene Group was considerably less important, and the other newly-defined categories included less than one percent each. Similarities in size of the three largest groups indicated the utility of the classification scheme, because use of South's (1977) system often results in assignment of 75 percent or more of all recovered artifacts to a single functional group. Group frequencies for the three types of sites were similar, except that relatively less architectural material and relatively more Personal Group material was associated with stores (Castille et al. 1986:7/4-7/9).

Census records, map data, property titles, and city directories provided a social history of some of the sites that was used to assess status and ethnicity of the occupants. Each of the twenty locales compared were ranked along a continuum from low to middle or high status. The artifacts associated with those locales were then compared. Fifteen of the twenty proveniences were considered middle status based on the archival record. Ceramics from these included a greater percentage of high status wares and a lower percentage of low status wares than did the five proveniences that the archival record indicated to represent a low status occupation (Castille et al. 1986:7/9-7/13).

An attempt was also made to determine whether the declining socio-economic status of residents of the project corridor during the late-nineteenth- and early-twentieth centuries was reflected in the archeological record. It was not, and this was considered to result from the fact that the modification of Miller's (1980) pricing scheme placed porcelain among high status wares despite the fact that inexpensive porcelain began to be produced during the period in question (Castille et al. 1986:7/12-7/13).

Archival research indicated that ethnic groups in the project corridor could be ranked, from highest status to lowest, as Germans, Italians, and Irish. A ceramic status comparison was undertaken to determine whether this was reflected in the archeological record. It was not, as Italian occupations yielded the highest percentage of high status ceramics. This was again considered a possible artifact of the classificatory scheme. The Italian occupations were relatively late so that a higher proportion of relatively cheap porcelain was recovered, while the modifications to Miller's scheme placed all porcelain in the high status category. Also, Irish occupations yielded a relatively higher percentage of high status ceramics than did German, which was again the reverse of the prediction made based on the archival record. Possible explanations are relatively similar status between the specific households compared or differential emphasis on stylistic display related to status by the different ethnic groups. Interestingly, the frequency of ceramics in German privies was lower than in privies associated with the other groups, and yard middens on German sites yielded relatively fewer artifacts, suggesting that they disposed of fewer items in the vicinity of their house (Castille et al. 1986:7/13-7/17).

Remains of wine and other alcoholic beverage bottles were also compared to determine whether higher status occupations were associated with relatively more wine consumption and lower status occupations with relatively more consumption of other beverages. No difference was indicated by the comparison. However, an analysis of wine seals did yield positive results. Such seals usually appear only on more expensive wines. Within the project corridor, they were recovered only from features associated with middle status occupations. Ethnicity was reflected by frequency of tobacco pipe fragments, which was greater for features associated with Irish occupations than for German occupations. There was no association between socio-economic status and pipe-smoking, but perhaps unexpectedly, the frequency of elaborately decorated pipe bowl fragments was higher on low status sites. Generally, however, all pipes were relatively inexpensive. Other artifact comparisons to examine ethnic differences were generally unsuccessful (Castille et al. 1986:7/17-7/23).

The New Orleans Cultural Resources Plan

In 1987, R. Christopher Goodwin and Associates developed a cultural resources plan under contract to the Division of Archaeology, Department of Culture Recreation and tourism. The purpose of the plan was to identify those areas that have a high probability of containing significant archeological deposits, to make recommendations concerning their preservation, and to suggest areas that were appropriate for public excavations or archeological displays. Three areas of the city were examined: The Vieux Carré, the Faubourg Marigny, and the American Sector of the Faubourg St. Mary.

Historical and archival materials were utilized to identify the major and minor socioeconomic groups during the French colonial, Spanish colonial, antebellum, and postbellum/twentieth century periods. In addition, the documentary record was utilized to determine the nature and probable distribution of different site types across the landscape, including administrative sites, agricultural sites, commercial sites, industrial sites, military sites, public sites, residential sites, and cemeteries. The two data sets were compared in an effort to define areas that have a high probability of association with each identified socioeconomic group. The groups were then ranked "in order of their historic archeological significance" (Goodwin et al. 1987:10). Ranking criteria utilized included "the potential for characteristic archeological remains, the frequency of occurrence in the archeological record, the unique occurrence of the group in New Orleans, the role of the group in the development of the city, and the role of the group in the development of the region" (Goodwin et al. 1987:10-11). These data were utilized to create priority locations for future archeological investigations. Sensitive areas were then delineated by comparing the priority areas to probable future land use.

Within the current project corridor, the entire Vieux Carré was ranked as having at least Moderately High sensitivity for archeological remains, with the exception of the riverfront area (ranked Moderately Low sensitivity). Additionally, three areas were ranked as having High sensitivity: the blocks surrounding Jackson Square as the administrative and clerical center of the colony, the block bounded by Governor Nicholls, Ursuline, Chartres, and Decatur streets as the site of the original Ursuline hospital, and the NORD property on Barracks between Burgundy and Dauphine as an accessible residential area. Within the Faubourg Marigny, the blocks between Dauphine, Esplanade, Royal, and Touro, and the blocks between Dauphine, Elysian Fields, N. Peters, and Frenchmen were ranked as having High sensitivity because of probable preservation of remains associated with the Dubreiul Plantation. The remainder of the area was ranked as being of Moderate sensitivity, with the exception of the area between N. Peters and the river, which was ranked as having Moderately Low sensitivity.

Convent of the Perpetual Adoration, Holy Cross National Historic District

Archeological investigations within the Holy Cross National Historic District were conducted within the square bounded by Royal, Tupelo, Chartres, and St. Maurice Streets. Presently standing on the square are the Convent of the Perpetual Adoration, completed in 1919, and a 1981 nursing home facility (Beavers and Lamb 1989:1-4).

The Convent of Perpetual Adoration is situated in an area that apparently was subdivided between 1834 and 1835. St. Maurice Parish was created in 1852, and the presently standing St. Maurice Church was erected in 1857. The Sanborn Insurance Map of 1896 indicates that by that date many lots in the area did not yet contain houses. A school once stood on part of the investigated square. Chain of title was not conducted to determine the date of construction and ownership of a dwelling standing on the property in 1896 immediately lakeward of the courtyard scheduled for impact (Beavers and Lamb 1989:20-35).

Eleven shovel tests were excavated within the courtyard, and a surface collection was made. Shovel tests yielded coal, cinders, gravel, animal bone, and whiteware sherds, one of which was dated to ca. 1950 by a maker's mark. Architectural debris was also recovered, and some evidence of fill on the site was noted. No artifact concentrations were observed (Beavers and Lamb 1989:1-4, 9, 13-16).

Investigations at the Site of the Cabildo

Earth Search, Inc., conducted archeological test excavations within the courtyard to the rear of the Cabildo (16OR129) in New Orleans' Vieux Carré (Yakubik and Franks 1997). The testing was performed under contract to the Louisiana State Museum in 1990.

On May 11, 1988, the roof and third floor of the Cabildo were destroyed by fire, and the first and second floors were damaged by water and smoke. The 1988 fire necessitated substantial repairs to the structure, and plans were made to improve the drainage within the courtyard behind the structure. Excavation units were placed to salvage remains along that route of the drainage lines and to investigate deposits associated with the 1730 Civil Prison complex. A total of 8.5 square meters of units were laid in. Two square meters of these could not be excavated because of the presence of subsurface concrete. Two 1 x 2 m units, one 1 x 1 m unit, and one 1 x 1.5 m unit were completed.

Three units were excavated within the grounds of the 1730 Civil Prison. These units were laid in at positions that, based on the architectural data available, would provide information on discrete areas of the complex. The first unit (a 1 x 1 m unit to which a 1 x 1 m extension was added) was placed to recover data on the construction of the front wall and corridor dividing wall of the prison. A second 1 x 1 m unit was placed to recover material from within the prison corridor. The third unit (a 1 x 1 m unit to which a 1 x .5 m extension was added) was placed to recover material from within a cell.

In the first unit, a 10 cm thick deposit of artifact-rich midden, probably represented the floor of the early-nineteenth-century prison. The midden deposit was dated ca. 1800 to 1840 on the basis of the artifact assemblage. The deposit lay below debris from the demolition of the prison (ca. 1840-1850) and was found directly above a flat-laid brick floor probably dating from a renovation of the prison in the period 1799-1800.

Below this floor was an earlier floor. The lower floor probably was laid after the 1788 or the 1794 fires which destroyed much of the colonial city. Severely decayed timber fragments were found below the foundations of the prison walls, which were constructed in 1730.

The other two units placed in the prison complex yielded early-nineteenth-century artifacts, also dating from the prison occupancy of ca. 1800-1840. These units did not expose the earlier wall foundations.

An additional 1 x 2 m unit was completed outside the walls of the 1730 prison. Eighteenth- and early-nineteenth-century artifacts were recovered from this unit. Among the material were a large number of bone button blanks, which suggested that button manufacture may have been an activity of the prison inmates. Almost all of the button blanks were found in a stratum deposited after 1780, and more likely after 1788, but before 1808.

Foundations of an undocumented pre-1780 foundation were exposed in this last unit. The brick wall foundations were supported by wooden timbers. The foundation probably represents the 1751 addition of a corridor vault to the 1730 prison.

The Site of the ca. 1731 Royal Military Barracks

The Historic New Orleans Collection contracted Earth Search, Inc., to undertake archeological investigations beneath the floor of the raised cottage at 726-728 Toulouse Street in 1991. This site (16OR136) has been one of the few excavated to date that provide architectural remains from the French Colonial Period. Therefore, the results of excavations are summarized here even though only preliminary analyses have been completed to date (Yakubik in prep).

Six contiguous 1 x 1 m units were excavated below the floor of the rear room of 726 Toulouse Street. The uppermost three strata were clearly associated with the nineteenth-century occupation of and renovations to the extant cottage, and the uppermost portion of the fourth stratum may have had similar origins. Below this the complexity of the stratigraphy increased dramatically as a result of destruction caused by the 1788 fire and its aftermath. Evidence of the fire was unmistakable; it included burned ceramics and glass as well as an observable increase in the amount of charcoal.

The archeological deposits indicated that at the time of the 1788 fire, a small building was located in the area excavated. Evidence of this building consisted of a two-course foundation of stretchers one brick in width. The upper course of brick was capped with a thin layer of shell mortar that may have served to secure either an additional course of brick or a wood sill. A builders' trench had been excavated to lay the foundation. It is likely that this structure was a kitchen building because of the large amount of domestic debris (ceramics, glassware, and animal bone) found in association with it. Ceramics were consistent with a late-1780s date. Faience and continental European coarsewares were recovered in quantity, as was creamware. A few sherds of pearlware also were collected. This type was introduced in Great Britain in 1779, and its recovery in this context confirms that it was imported to Louisiana shortly thereafter.

The residence associated with this small outbuilding was undoubtedly located closer to Toulouse Street than was the kitchen. A partially charred beam (20 cm in width) which extended diagonally across the excavation units may have derived from this structure. The beam fell directly onto the northeast corner of the kitchen, crushing the corner of the brick foundation. The beam was charred only on the underside, which presumably would have been the exterior surface. The charred portion of the beam was perfectly preserved. The unburned, upper surface of the beam decomposed, leaving a dark brown (7.5YR 3/2) organic stain. The interior of the beam, which had also decomposed, was filled with debris from the fire. Clearly, the beam fell during the conflagration.

Other evidence for the structure associated with the beam was somewhat elusive. A thin (ca. 2 cm thick) lens of black (5YR 2.5/1) organic material was noted immediately to the west of the beam. It gave the appearance of a decomposed board, and was associated with several wrought nails as well as what appeared to be a handle. Because it was not burned, it may have been an interior wall board which was deposited during the collapse of the rear wall of the building.

Architectural features associated with the Royal Military Barracks that were erected on the site ca. 1731 were unmistakable and in an excellent state of preservation. At about 66 cm below datum, a lens of oyster shells was uncovered in the northernmost excavation units. This thin lens of shell also contained faience sherds, and was located on top of sterile subsoil (about 70 cm below datum). The shell lens terminated abruptly in a line approximately parallel to Toulouse Street. About 25 cm south of the edge of the shell lens, vertical wood fibers were noted running east/west through two of the units. When the fibers that appeared to be the best preserved were cleared for the removal of wood samples, it became apparent that they were actually the tops of intact planks, and that this was in fact the remains of the rear wall of the military barracks. The remains of three of these planks were exposed to a depth of 125 cm below datum. The best preserved of these planks (the easternmost) had a basal width of 20 cm and thickness of 5 cm. The bases of the planks rested on the center of a beam that was 33 cm wide and 9 cm thick.

The three planks were removed for conservation. During this procedure, it was noted that there was an additional plank to the west of the three that were exposed. In addition, a post, which measured 22.5 x 24.5 cm at the base, was noted to the east of the three planks. The post was also fully exposed and removed for conservation. Finally, in the course of exposing the post for removal, two horizontal boards were noted extending out of the east profile of the unit. They almost abutted the west side of the post.

With the possible exception of the horizontal boards, all of the above architectural features were subterranean. A trench was excavated and the timber was laid as a sill, while the planks formed the wall frame. The post may have served either as a main roof support, or as a door jamb. Evidence for the latter is the juxtaposition of the horizontal boards, which may have been the door sill.

Few artifacts were recovered from the builders' trench adjacent to the features other than an occasional oyster shell or brick fragment. However, what appear to be three peach pits were found in this context. Also, a well-preserved wrought spike was collected from directly beneath the beam.

Investigations at 16OR135 for the United States Postal Office

Pursuant to a contract with the U.S. Postal Service, Earth Search, Inc., conducted archival research and Level 1 archeological investigations on a future construction site in 1991 (Franks and Yakubik 1991). Square 509 is located in New Orleans' Garden District and is part of the Uptown National Historic District. Archival research revealed that no structures were present on the square prior to 1891. A minimal industrial/commercial facility was present from that date until 1899. This was a paving and gravel company that built a stable, a blacksmith shop, and a few sheds.

Shovel tests and surface collections within present residential backyards yielded only one artifact that possibly pre-dates residential use of the square beginning in 1920. Massive construction associated with foundations and/or concrete parking lots overlie those portions of the gravel and paving company facility located in Square 509. Construction here has undoubtedly resulted in severe disturbance. Thus, the archeological resources at this location were determined not to have the potential to yield significant information about the late-nineteenth century commercial/industrial facility.

United States Custom House (16OR138)

In March 1994, Earth Search, Inc., performed archeological monitoring of construction at the United States Custom House (16OR138) on Canal Street (Jones et al. 1994). Located within New Orleans' Vieux Carré, the Custom House is a National Historic Landmark. While excavating trenches for a below-ground line, the construction crew discovered a subsurface concentration of artifacts. Earth Search, Inc., was contracted by the General Services Administration to monitor further excavations.

Mid-nineteenth-century artifacts were recovered from the construction trenches, including a relatively large number of whole and near-whole bottles (mineral water, ale, and liquor bottles). The assemblage primarily represents refuse deposited during the initial construction phase of the building ca. 1848-1861. The artifacts were not found to contribute significantly to our understanding of the building's role in New Orleans history, but their presence suggest that other historic remains may survive below the present ground floor surface.

New Orleans Naval Support Activity (East Bank)

In 1992, Geo-Marine, Inc., performed an architectural and historical assessment of the New Orleans Naval Support Activity, East Bank prior to a proposed upgrading of three 1918 warehouses. Of 15 properties evaluated, seven were less than 50 years of age. Of the pre-1946 structures, only the original facility of the three warehouses, another building, the wharf, and the wharfhouse were found to be eligible for nomination to the National Register under Criterion A as an expression of early-twentieth-century policies of federal and local cooperation to build facilities to help the war effort. Further, the authors noted that the complex was eligible under Criterion C as distinctive examples of concrete warehouse architecture. They recommended that the distinctive characteristics of these buildings not be altered unnecessarily, and that any renovations or rehabilitations be done in accordance with the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings The authors judged that the renovations would have no visual impact on the surrounding neighborhood, because the view of the warehouses is almost entirely blocked by levees (Doty-Freeman et al. 1992).

No archeological investigations were undertaken. However, the authors noted that remains of the Manuel Andry House and the Ursuline Convent might be preserved within the facility. Archeological testing prior to construction or monitoring during construction was recommended (Doty-Freeman et al. 1992).

Test Excavations within the Holy Cross Historic District

Earth Search, Inc., conducted archeological test excavations under contract to the New Orleans District U.S. Army Corps of Engineers within five city squares in the Holy Cross Historic District in 1991. The project area was potentially threatened by construction related to replacement of the present lock system of the Inner Harbor Navigation Channel (Yakubik and Franks 1992a).

Fieldwork was conducted within the framework of a research design prepared by the Museum of Geoscience of Louisiana State University (Franks et al. 1991). Prior to the commencement of investigation, historic maps of the study area were digitized using CAD in order to create overlays to assist the prediction of the locations of historic features. These included the remains of a nineteenth-century brickyard, a slave quarters complex, truck farms, and post-1869 residential lots.

Shovel tests were excavated at gridded 5-meter intervals within portions of three city squares and within five presently-occupied residential lots. Features discovered during shovel testing included foundations, privies, refuse deposits, sidewalks/patios, and destruction debris. In addition, features associated with the brickyard kiln were discovered. Artifact distributions were examined utilizing "topographical maps" and surface plots generated by the program SURFER. Gridded shovel testing at small (5 m or less) intervals proved to be a valuable tool for archeological investigations within an urban context because of its utility for both locating subsurface features and revealing patterned artifact distributions (Yakubik and Franks 1992a:133-161).

Four excavation units were dug. One of these was located in an area which historic map overlays suggested was the location of the edge of a slave quarters complex. Shovel tests there suggested the presence of a high concentration of antebellum ceramics. Deposits were found to be largely intact despite some disturbance from an intrusive trash pit. In addition, two postmolds and an intact post may have been associated with the antebellum occupation (Yakubik and Franks 1992a:161-171).

A second unit was excavated on the site of one of the brickyard kilns. Features associated with the kiln included unusual brown and yellowish red soils. While the distinctive stratigraphy certainly is associated with the kiln, the limited nature of the excavations precluded interpretations of the operation of the kiln (Yakubik and Franks 1992a:171-191).

The third unit uncovered a small, shallow, brick-lined area of uncertain function. Possibilities included a privy or a multi-purpose shed. The forth unit excavated a large portion of a privy that was open at least as late as 1906. The privy shaft consisted of an unlined pit. In addition, it had an overflow pipe which appeared to empty into an adjacent open ditch along the road. A variety of late-nineteenth-century ceramics and personal items were collected from the privy, as well as a rich collection of turn-of-the-century bottles (Yakubik and Franks 1992a:191-212).

Insofar as artifact analyses were concerned, minimum number of vessel estimates were calculated for both ceramics and glass. This technique, which has had limited use in Louisiana historic contexts, is extremely useful because it tends to equalize categories for the purposes of functional analyses. Minimum vessel estimates also proved useful for comparing ceramic price level rankings based on decorative types (Yakubik and Franks 1992a:214-237).

Yakubik and Franks (1992a) suggested a series of price level rankings for the analysis of late-nineteenth/early-twentieth-century ceramics. These rankings were based on prices in the 1908 and 1909 Sears catalogues, and were intended to provide an alternate model that could be tested utilizing the excellent socioeconomic documentary data available for Holy Cross. Results were ambiguous, and it was recommended that the rankings not be rejected until tested with larger samples. Examination of ceramic price level rankings of the antebellum material using Miller's (1980) scale was more successful (Yakubik and Franks 1992a:214, 235-242).

Ceramic variety was examined both using numbers of decorative types and ceramic form. The first of these appeared to be correlated with sample size, while the second appeared to be related to depositional context. Again, because of the small sample sizes and the limited nature of the investigations, it was recommended that this technique not be rejected for the investigation of socioeconomic variability (Yakubik and Franks 1992a:242-244).

Finally, Yakubik and Franks (1992a:200-204), while rejecting the rote examination of artifact functional categories for the elucidation of artifact "patterns," acknowledged that artifact function should not and could not be ignored during analysis. Instead, they proposed a typology sufficiently flexible to allow comparison with assemblages analyzed using other systems through the collapse and reorganization of categories. In addition, the dendritic framework of the typology facilitates intra-category differences generally obscured by more broadly-drawn functional categories. Limited testing of the utility of this typology (with minor modifications) using the Holy Cross artifacts demonstrated its practicality as an analytic tool (Yakubik and Franks 1992a:247-253).

Bywater Historic District

R. Christopher Goodwin and Associates performed architectural assessment and archeological reconnaissance of 64 blocks within and adjacent to the Bywater Historic District. The project area was adjacent to the Industrial Canal, and was designed to provide information to the New Orleans District, U.S. Army Corps of Engineers, on the cultural resources that might be impacted by replacement of the existing canal lock. A total of 179 standing structures and complexes were examined, 112 of which were judged to possess integrity. These structures were then evaluated both individually and collectively using National Register criteria. As a result, two blocks within the project area were evaluated as intrusions in the Bywater Historical District, and the authors recommended that the district boundaries be redrawn to exclude one of these two blocks. However, a six block area to the west of Poland Avenue was noted as a visually cohesive group of twentieth-century residences as was recommended to be added to the District. Further, it was recommended that the Galvez Street wharf is eligible for nomination to the National Register under Criterion A (Hinks et al. 1994).

Historical data were utilized to evaluate potential archeological resources in the study area. Sources included historic maps, census records, city directories. These data were integrated along with information concerning disturbances, the latter of which was determined both by visual examination and historical research. A research design was then developed that considered issues such as the development of the urban landscape, ethnicity within the project area, agriculture within the project area (including both antebellum plantation remains and postbellum truck farms and dairies, and remains associated with the Second Ursuline Convent). Specific research questions to be addressed were presented, as well as testing strategies for each issue. No subsurface testing was undertaken (Hinks et al. 1994).

The Old Ursuline Convent

In July of 1995, archeological investigations consisting of a systematic regime of shovel testing were undertaken by Earth Search, Inc. at the grounds of the old Ursuline Convent in order

to determine if significant resources were located in areas that would undergo subsurface disturbance during landscaping (Yakubik and Dawdy 1995). The strategies employed differed for the three types of ground disturbance that were anticipated: the excavation of holes for planting trees, the excavation of beds for curb stones, and the laying of French drains. The depths of the shovel tests were determined by the planned depth of ground disturbance. All shovel tests measured 30 x 30 cm in plan view, and all excavated soil was screened through 1/4" mesh.

All of the 52 shovel tests excavated were positive, although in some cases this consisted only of construction rubble. Given the large amount of architectural destruction debris present at the site, brick, mortar, plaster, slate, and coal were not collected. All other cultural materials were collected. Overall, the artifactual finds and stratigraphy of the shovel tests indicated that the first 20 -30 cm of the convent yard consists of modern fill or disturbed rubble deposits. Below 30 cm, preservation is variable.

Ursuline Street Wall. The area beside the Ursuline Street wall (designated site west) has been disturbed by the excavation of a modern trench for a cable line. Within the utility trench, sand was mixed with rubble and artifacts associated with the Almonaster Chapel and St. Mary's Italian School, which were formerly present in this area. Three half-bricks still mortared together with Portland cement and an aluminum can pull-tab found within the dense rubble indicate that the deposit dates to the destruction of St. Mary's Italian School in the 1980s.

The Almonaster Chapel was built in 1786 and was recorded as being in very poor condition in 1866. Records are unclear about what happened to the chapel, but a seminary was established on the chapel site some time between 1870 and 1881 (Shenkel and Beavers 1978:3-15). The building underwent numerous modifications, but church records indicate the most radical alterations occurred between 1875 and 1919, when the site was transformed into St. Mary's Italian School (Shenkel and Beavers 1978:19). Changes in the building were so substantial (for example, expansion from a 1-1/2 story structure to a 4 story structure), that it was assumed the old walls of the Almonaster Chapel had been completely torn down at some point in the nineteenth century. However, an archeological assessment of the first story remains made in the 1970s indicated that, in fact, "a major portion of the Ursuline Street wall is of the original 1786 construction" (Shenkel and Beavers 1978:34). The age of the other walls was less certain, although they appeared to be largely nineteenth century in origin.

The artifacts recovered from the vicinity of the Ursuline Street wall represent occupations from the Almonaster Chapel, St. Mary's, and the modern period. However, no discrete cultural strata could be identified. It is possible that a depositional separation exists between the Almonaster Chapel and St. Mary's remains, but that this interface, if present, lies below the depth of anticipated disturbance.

Old St. Mary's Wall. The subsurface remains of the eastern wall of St. Mary's school are included in this area. Four concrete bases are all that survive from a row of supports used to stabilize the first story wall before it was torn down. The rubble layer from shovel tests in this area contained by far the densest concentration of artifacts at the site. The vast majority of these dated to the nineteenth century. Plain and decorated whiteware ceramics predominated, however, the earlier pearlware and the later ironstones and yellowwares were also represented. A small amount of creamware and faience dating to the eighteenth century was recovered in the area, although as with the Ursuline Street wall deposits, there did not appear to be any clear stratigraphic separation. Surviving portions of St. Mary's wall were found only in one of the shovel tests. This indicates that the wall remains are irregular as to depth, as might naturally occur with demolition efforts.

South Party Wall. This area comprises a party wall parallel to Decatur Street and a short open area extending from the wall in front of a neighboring building on Ursuline Street. All the

tests indicated deep and extensive disturbance, possibly relating to gardening activities. Although some of the shovel tests within this area were artifact rich, there was also evidence of disturbance down to depths varying between 20 and 50 cm below ground surface. Artifacts found in the shovel tests consisted mostly of eighteenth-century ceramics, non-diagnostic glass, and modern debris.

In summary, ESI's investigation found that the planned landscaping would in most cases affect areas that have already experienced ground disturbance. In other cases, the impact would be so minor, that it would not affect the research potential of archeological remains at the Ursuline complex (Yakubik and Dawdy 1995).

The Harrah's Casino Site

In January 1995, Earth Search, Inc., was contracted by Harrah's Jazz Company to perform archeological documentation and monitoring of the New Orleans land casino site. Archeological investigations were undertaken in two phases. Phase I, consisting of background research and monitoring program development, was performed prior to the beginning of construction. Phase II consisted of archeological monitoring of construction and the analysis of recovered remains (Maygarden and Dawdy 1995).

The entire area developed by Harrah's Jazz Company consists of nine city blocks or squares in the First Municipal District. Eight of the squares were occupied by the Rivergate exhibition facility. The Rivergate was bounded by Canal Street, Delta Street, Poydras Street, and South Peters Street. Other squares were vacant lots used for parking or were occupied by nineteenth-century buildings. Harrah's development plans included the construction of a new land-based casino on the old Rivergate site, the excavation of a pedestrian tunnel underneath Poydras Street, and the construction of a parking garage.

After the background research was completed, an archeological monitoring program was developed based upon the designation of high and low probability areas for archeological remains and the construction plans. It was determined that a regimen of low-intensity monitoring was appropriate for the Rivergate site, while high-intensity monitoring was warranted for the Poydras Street Tunnel excavations. Excavations at the parking garage construction site had already been completed; monitoring in this area was not required by the contract between the City of New Orleans and Harrah's Jazz Company.

The research design called for minimal monitoring of the Rivergate site, which was considered a low probability area for intact archeological remains given ground disturbance that occurred with the original construction of the Rivergate complex. This prediction for a high level of modern ground disturbance was verified by observations in the field. The results of excavation monitoring at the Rivergate site were entirely consistent with expectations derived from the land use history.

Excavations for the Poydras Street Parking Tunnel were undertaken in two phases. The first phase concentrated on the northern half of the Poydras Street roadbed (adjacent to the old Rivergate site); the second phase concentrated on the southern half of the Poydras Street roadbed (adjacent to the new parking structure). These excavations were intensively monitored due to the relatively high potential for archeological remains.

Background research indicated the land occupied by the Harrah's Casino site lay outside the Mississippi River protection levees prior to 1852. An 1837 engraving shows an expansive, informal batture space between South Peters and the river being utilized by merchants and shippers (Maygarden and Dawdy 1995:Figure 2-2). Structural improvements on the batture appear to have been restricted to wharves, boardwalks, sheds, enclosures, scales, and other

impermanent architecture. By 1840, the batture was so wide, that city engineers proposed moving the levee back and developing the batture. The land was legally acquired by the city in 1852, after which major commercial development ensued with the building of large brick warehouses, stores, and industrial concerns. During the twentieth century, the area saw gradual decline. Urban renewal efforts in the 1950s and 1960s resulted in the demolition of some nineteenth-century buildings and the establishment of new structures such as the Rivergate. Four main types of historic cultural features were encountered during archeological monitoring which can be interpreted in light of this land-use history: small refuse pockets, large refuse deposits, brick features, and wooden features.

Although monitoring was not required in the area of the parking garage, Phase I background research indicated that this was a high potential area for archeological remains. Therefore, the field project manager was interviewed and the daily site photographs were inspected. In areas where pile driving for the parking garage foundation was to be performed, mechanical excavations had been conducted to a depth of 3' to 6' below street surface (ca. 1 to 2 m) in order to remove obstructions. Elsewhere, only clearing of the asphalt and concrete paving was performed. Most of the obstructions encountered during mechanical excavations appeared to be modern concrete structures (slab foundations, wall foundations, and a cement-lined elevator shaft). However, some brick wall foundations were present near the sidewalk of Poydras street and loose brick rubble extended to a depth of ca. 5' to 6' (ca. 1.5 m) south of the street. Additionally, three stepped footings were encountered. These stepped footings were laid on cypress planks, and they probably belonging to brick commercial buildings dating to the middle of the nineteenth century. Photographs show historic artifacts mixed into or lying just below the destruction rubble. This documentation gave few clues as to the historic use or architectural sequence of the site beyond what was garnered from the general land-use history.

The results of the field investigations were interpreted in light of the land-use history of the site. Land use prior to the early-1850s was limited to impermanent wooden structures associated with the wharves and boat landings laying outside the levee. During archeological monitoring of the Poydras Tunnel excavations, it was discovered that some remains of these impermanent structures have survived well preserved at a level 12' to 15' below the current road surface. More permanent architecture and commercial development on the casino site occurred after a prolonged legal battle regarding batture properties was settled in 1852. Within the study area, about one-quarter of the active businesses were commission merchants or cotton factors. These enterprises were still a major percentage of the occupants into the first quarter of the twentieth century. A brick wall footing belonging to one of these mid-nineteenth century commercial buildings was encountered during intensive archeological monitoring of the Poydras Street Tunnel excavations.

Canal Street Corridor Streetcar

In 1995, Richard Beavers performed a Level I Reconnaissance of six alternate routes for the Canal Street streetcar. Each of the routes were evaluated with regard to their potential for adverse impact to historic districts, historic properties, and known archeological sites. Historic map and other documentary sources were also consulted. No field investigations were undertaken. The six alternative routes were ranked in order of preference (Beavers 1995).

Villa Meilleur

In 1996, Earth Search, Inc., undertook National Register testing at the Villa Meilleur site (16OR142). Investigations consisted of the excavation of 23 judgmentally placed shovel tests and one 1 x 1 m unit. These confirmed that, despite landscaping in the lot beside the villa, archeological evidence of eighteenth- and nineteenth-century activity in the area is preserved. Ground disturbance is limited to the uppermost 25 cm of deposit. The presence of intact

features, including a foundation and associated builder's trench and a laid brick patio confirmed that the site has integrity. Mean ceramic dating similarly demonstrates that the strata at the site are chronologically distinct and provide evidence of occupation dating at least as far back as the late-eighteenth century. Although only a small assemblage of artifacts was collected, these were utilized to investigate issues concerning site chronology, the economics of the site's residents, and diet. In particular, the collection yielded an unusually high average ceramic index value when compared to occupations in rural contexts, suggesting the household life cycles and/or income strategies may be different in urban and rural contexts, as well as differences in market access (Lee et al 1997).

The Maginnis Cotton Mill Site

Between December 1996 and October 1997, excavation was conducted at the site of the Maginnis Cotton Mill, in the Warehouse District of New Orleans on the block bounded by Constance, Annunciation, John Churchill Chase, and Poeyfarre Streets. This study was done by the Greater New Orleans Archaeology Program of the College of Urban and Public Affairs at the University of New Orleans under contract with the Cotton Mill Limited Partnership and its managing partner, Historic Restoration, Inc. This excavation was part of the renovation of the standing 1882 Maginnis Cotton Mill into luxury condominiums. Excavation was completed within open areas in the building, such as the courtyard and elevator shafts. A total of 26 shovel test pits, 12 1x1 meter excavation units were tested, and archeological monitoring of three elevator shafts under construction, as well as data recovery excavation of a cotton-mill era privy was conducted
during this exemplary investigation (Dawdy and Ibanez 1997).

The Maginnis Cotton Mill, built in 1882, was constructed as a state-of-the-art cotton mill that was part of a focus of greater industrialization in the South. Dawdy and Ibanez questioned what worker conditions were like in the mill during its 40 years of operation, and whether the presence of women and children, the majority of mill workers, was discernible. In their investigations, they found scant personal effects of the workers, which underlined the working conditions of the times as well as Maginnis' desire to run a "tight ship" and to create a body of mechanical workers, whose personal life was kept separate from their work at the mill (Dawday and Ibanez 1997:116-117).

Before this site housed the cotton mill, it was the site of the Duplessis plantation great house. Dawdy and Ibanez' investigations were also focused on the extent of preservation of these colonial era remains. In the course of their excavations they found that the preservation of the Duplessis great house was excellent, when the building was demolished, the remains were left in place and capped with soil to raise the level of the ground. From these remains, Dawdy and Ibanez were able to draw conclusions about the plantation, its occupants, its material consumption patterns as compared to plantations which were further from cities, and the crops grown on the site (Dawdy and Ibanez 1997:117-120). Specifically, they found that while there were significant differences in artifact distributions that could be attributed to rural, suburban, or urban contexts, household size did appear to be reflected in minimum vessel counts. Interestingly, they also found that expenditures for household goods seemed to be more reflective of social status than of the actual wealth of the occupants. Finally, data suggested that, not surprisingly, the inhabitants of the Duplessis plantation had better market access than did residents on plantations farther from New Orleans.

Madame John's Legacy

In 1997, the Greater New Orleans Archaeology Program of the College of Urban and Public Affairs at the University of New Orleans was contracted by the Friends of the Cabildo, with additional support from the Edward Wisner Trust Fund and the Booth Bricker Fund, to

complete archeological investigations of the historic building complex that compose Madame John's Legacy. This archeological investigation was prompted by the renovation of Madame John's Legacy by the Louisiana State Museum (Dawdy 1998).

In the summer of 1997, six 1 x 1 m excavation units were excavated in 5 cm levels within natural strata and screened through ¼-inch mesh. These units were placed within two areas. Four 1 x 1 m units were placed in the courtyard where the renovation would impact sub surface depositions, and two contiguous 1 x 1 m units were placed within the kitchen area. These areas yielded rich cultural deposits that Dawdy was able to associate with specific time periods (such as a trash pit from the 1788 fire) and specific family occupations (Dawdy 1998:115-117). One focus of this excavation was the evolution of historic New Orleans courtyards, and their changing use through French, Spanish, and American occupations (Dawdy 1998:117-119). Dawdy also attempted to uncover conditions of urban slavery, but this proved problematic given the proximity of African-American slaves, non-slaves, and European-Americans within a single dwelling (Dawdy 1998:120). Another of Dawdy's focus in the material culture analyses was diet and consumption of food-related durable goods, specifically within a Creole population. Dawdy examined the importation of foreign goods (such as that represented by wine bottles) versus Native American products, and found that after a preliminary focus on French goods, the Creole population that lived in Madame John's Legacy tended to rely less on imported goods. Similarly, this was apparent in the faunal assemblage at the site, which strongly represented native species such as alligator and small wild game (Dawdy 1998:120-122).

The Friedrich House

Located on the outer edge of the backslope of the natural levee of the Mississippi River, the Friedrich house site is situated at the corner of Natalie and Fairway Drive in Old Metairie. It has been designated site survey number 16OR139. The archeological portion of this historic home consists of an historic well, or cistern, to the rear of the building. It was discovered approximately 30 cm (11.8 in) below the ground surface. Excavation methods included a 50 x 75 cm (19.7 x 29.5 in) test unit that was not screened. The only artifacts recovered seem to be 1 nail and some mortar. Under Criterion D, the house site was deemed potentially eligible for inclusion on the National Register of Historic Places.

CHAPTER 7
FIELD INVESTIGATIONS

Methodology

Prior to excavation, remote sensing utilizing thermal imaging was undertaken. A 30-foot boom lift was utilized to provide the remote sensing specialist with the necessary height during imaging. Two separate sensors were used to image the ground area, a sterling cooled infrared camera looking in the 3-5 micron wave length using an INSBA detector, and a Ferrous electric infrared sensor looking in the 7-12 micron wave length. Both sensors had a Delta-T of .05 degrees C. A standard thermographic Palm Soft software program was used to produce 3-D images of the anomalies detected. All areas of the embankment that were not inaccessible due to vegetation were examined.

Six backhoe trenches were excavated in pairs along the embankment. Features encountered in these trenches were hand excavated. Trenches 1, 3, and 5 were cut perpendicular to the embankment in order to document the cross sectional stratigraphy and features. Trenches 2, 4, and 6 were excavated parallel with the embankment and formed a T-shape with the previous trenches. Cross-sectional trenches were excavated the width of the property, approximately 12 m (39.4 ft). Trenches 2, 4, and 6 were each approximately 20 m (65.6 ft) in length. The six trenches ranged in depth from approximately 1.5 m (4.9 ft) to 2.6 m (8.5 ft) as measured from the top of the embankment where an arbitrary datum was set. After initial mechanical excavation revealed structural elements buried within the earthwork, hand excavation by shovel and trowel was undertaken. All structural features were excavated and fully documented.

In addition, 18 smaller trenches, or exploratory sampling areas, were excavated in order to further document the nature of the interior structural elements of the embankment. The purpose of these trenches was only to probe, or sample, the ground in order to (a) determine if there was any variability in the subsurface features of the embankment beyond those observed in the six fully-documented trenches; (b) ground truth anomalies detected during thermal imaging; and (c) determine the types of underground obstructions that might be encountered during canal construction. All trenches were backfilled immediately upon completion of documentation.

Results of the Investigations

Trenches 1 and 2. After initial remote sensing of the railroad embankment, the first area chosen for backhoe excavation was immediately west of the intersection of the embankment and Mistletoe St. (Figure 25). Trench 1 was excavated to a depth of approximately 1.6 m (5.2 ft). Its width was about 1.6 m (5.2 ft), and it extended roughly 12 m (39.3 ft) in length, or the width of the embankment. Trench 2 extended about 21 m (8.9 ft) west of the center of the west wall of Trench 1. Trench 2 was approximately 1.2 m (3.9 ft) in width and 1.3 m (4.3 ft) in depth.

Soils within Trench 1 (Figure 26) consist of an uppermost stratum of 10YR 3/2 (very dark grayish brown) loamy sand with crushed gravel of the same color; the latter comprises approximately 25 percent of the matrix. Stratum I extends approximately 10-20 cm below surface (cmbs) (3.9-7.9 in). Stratum II is a 7.5YR 4/3 (brown) sandy loam with 7.5YR 7/6 (reddish yellow) and 10YR 8/1 (white) gravel; the gravel comprises approximately 75 percent of the matrix. Stratum III is a 5YR 4/6 (yellowish red) loamy sand with the same gravel fill as in Stratum II. Both Strata II and III extend deeper in the center of the embankment than is the case in the remainder of the trench. Below this is Stratum IV, a layer of 7.5YR 3/4 (dark brown) clayey sand with 7.5YR 7/6 (reddish yellow) gravel; the gravel comprises 25 percent of the matrix. Stratum IV is very thin and present only in the southern section of the trench. Stratum V is a 7.5YR 5/6 (strong brown) sandy clay with 7.5R 5/8 (red) clay mottling. Lastly, Stratum

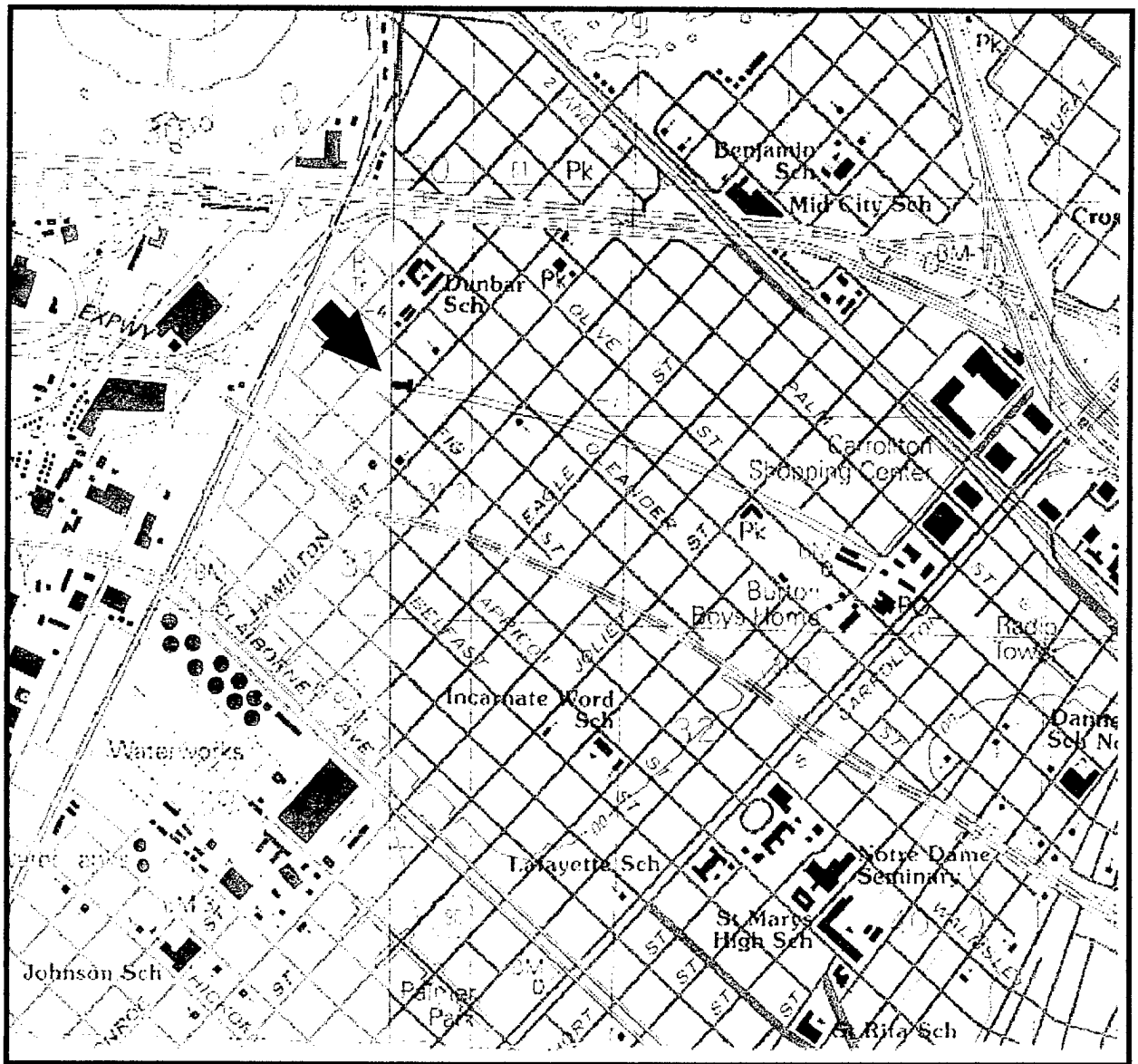
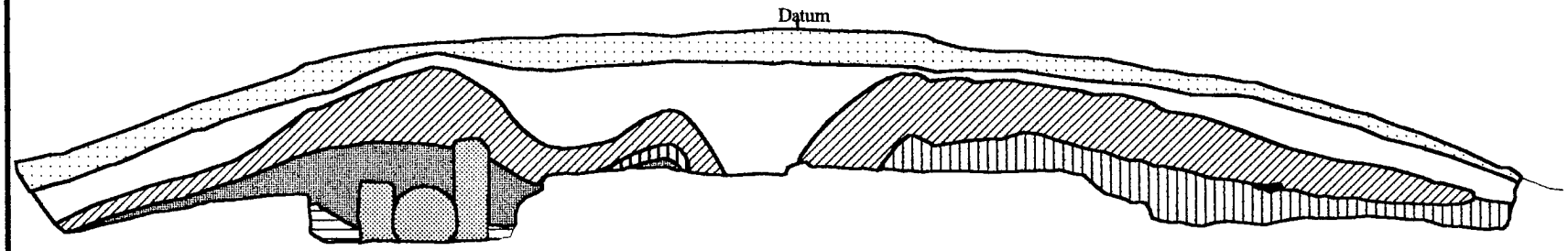


Figure 25. Excerpt from the *New Orleans East* and the *New Orleans West* 7.5' quadrangles (1994) showing the locations of Trenches 1 and 2.



Stratum I 10YR 3/2 (very dark grayish brown) loamy sand with 25% mixed gravel [10YR 3/2 (very dark grayish brown)]

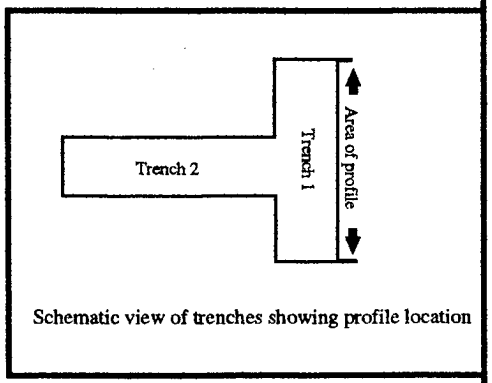
Stratum II 7.5YR 4/3 (brown) sandy loam with 75% gravel [7.5YR 7/6 (reddish yellow) and 10YR 8/1 (white)]

Stratum III 5YR 4/6 (yellowish red) loamy sand with 75% gravel [7.5YR 7/6 (reddish yellow) and 10YR 8/4 (very pale brown)]

Stratum IV 7.5YR 3/4 (dark brown) clayey sand with 25% gravel [7.5YR 7/6 (reddish yellow)]

Stratum V 7.5YR 5/6 (strong brown) sandy clay with 7.5R 5/8 (red) clay mottling and gravel [7.5YR 7/6 (reddish yellow)]

Stratum VI 7.5YR 5/1 (gray) silty clay with 7.5 YR 5/8 (strong brown) mottling



Schematic view of trenches showing profile location

Figure 26. Trench 1 east profile.

VI consists of 7.5YR 5/1 gray silty clay with 7.5YR 5/8 (strong brown) silt mottling. There was considerable disturbance of the embankment prior to backhoe excavation; this is reflected in the stratigraphy (Figure 26).

A pronounced "dip" at the center of the embankment was revealed in the stratigraphy of Trench 1 (Figure 26). This is undoubtedly the result of many tons of train passing over the earthen embankment and compressing the underlying strata. Examination of Figure 26 demonstrates that Strata III through V are compressed. During maintenance, the clay (Strata IV and V) was supposed to be shaved level so that the embankment would not hold water. This apparently was not done.

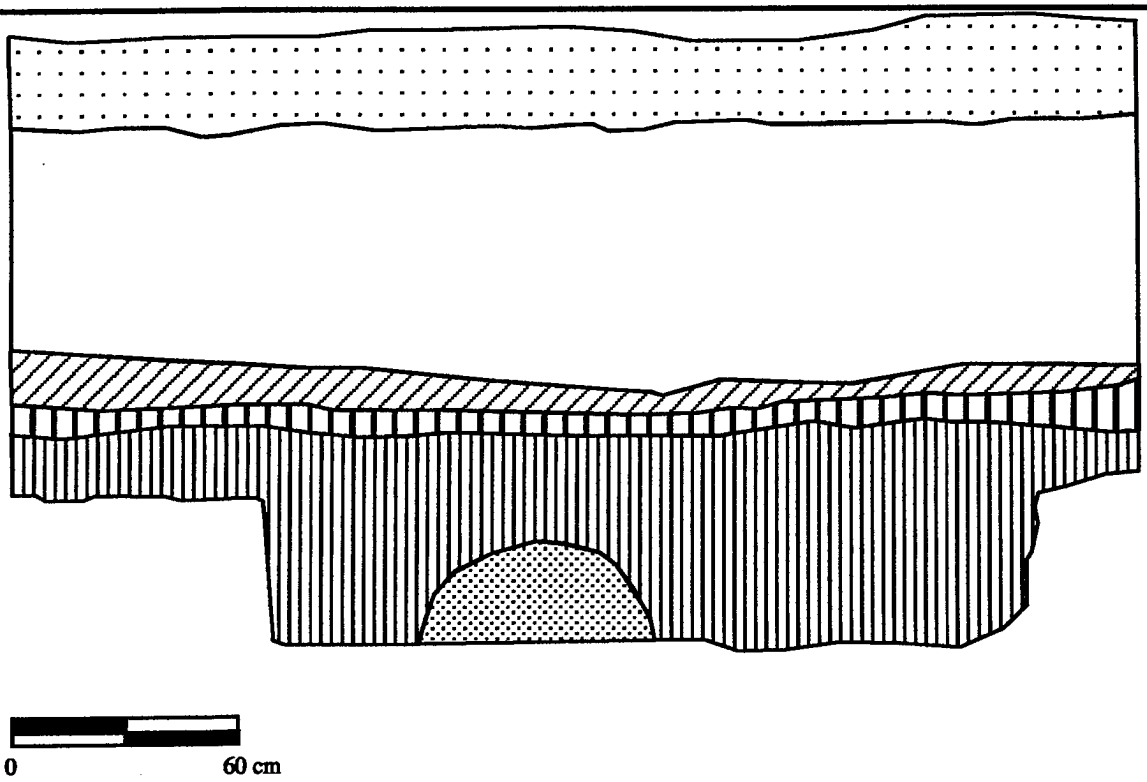
Soils in Trench 2 (Figure 27) are very similar to those of Trench 1. Stratum I is a 10YR 3/2 (very dark grayish brown) loamy sand with crushed gravel of the same color; the latter comprises approximately 75 percent of the stratum. Stratum I extends approximately 20 cmbs (7.9 in). Stratum II consists of 7.5YR 4/3 (brown) loamy sand with 7.5YR 7/6 (reddish yellow) gravel; the gravel comprises approximately 50 percent of the stratum. Stratum II extends to approximately 80 cmbs (31.5 in). Stratum III is a thin lens, approximately 10 cm (3.9 in) thick; it consists of 7.5YR 3/3 (dark brown) loamy sand with 7.5YR 7/6 (reddish yellow) gravel, which comprises approximately 75 percent of the stratum. Stratum IV is another very thin lens of 5YR 5/8 (yellowish red) clayey sand with 7.5YR 7/6 (reddish yellow) gravel comprising 75 percent of the stratum. It measures approximately 10 cm (3.9 in). The lowest stratum, Stratum V, is a 7.5YR 3/1 (very dark gray) clay with 7.5YR 4/6 (strong brown) mottling.

Backhoe excavation slowly unearthed the gravel and soil fill until features were encountered. The tops of vertical pilings were discovered approximately 1 m (3.28 ft) below the surface of the embankment. These cut through all strata except Stratum I. The pilings were then unearthed by hand for documentation. The first two trenches yielded a total of 50 vertical pilings and two horizontal beams. Although there was no standard distance between the pilings, most were placed approximately 50 cm (19.7 in) apart.

In the northern section of Trench 1, a large wooden beam (S1-1) is situated between rows of pilings (Figure 28, Plate 1). The top of the beam is approximately 148 cm (58.3 in) below datum, within Stratum V. The horizontal beam was placed parallel, or longitudinal, to the railroad. Pilings were driven approximately 50 cm (19.7 in) apart on either side of the horizontal beam. Hand excavation unearthed half of S1-1, thus extending the depth of the trench in this area by 40 cm (15.7 in). Other than the *in situ* features themselves, no additional artifacts were found in Stratum V.

In the western portion of Trench 2, another horizontal beam (S2-45) was encountered (Figure 29, Plate 2). Neither parallel nor perpendicular to the embankment, S2-45 did not seem to be associated with the pilings as did S1-1. Hand excavation of a 1 m square area removed the clay from around the huge log, which extended the width of the trench. The only artifacts found in this area besides the features themselves were large chips of wood that had obviously been hacked with an axe (Plate 3). It is likely that the wood chips are evidence of the felling of trees for the construction of the embankment. If metal construction materials were discarded in this vicinity, they were not within the confines of the embankment itself, since no other artifacts were unearthed in this lower stratum.

All the pilings observed in the project area are yellow pine. All horizontal beams and wood chips unearthed in the first two trenches are of cypress (Table 2), as are all the horizontal beams throughout the project area. It appears that many of the pine pilings were driven at a later date, especially pilings S2-1 through S2-44. These pilings extend through all except the uppermost strata. The pine pilings around the cypress beam S1-1, however, appeared to have been placed as a unit with this beam. The whole structure was sealed in a layer of Harahan clay that



0 60 cm

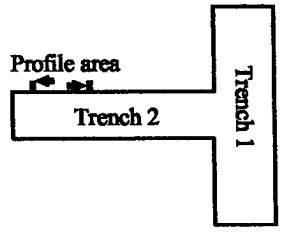
Stratum I 10YR 3/2 (very dark grayish brown) loamy sand with 75% gravel [10YR 3/2 (very dark grayish brown) crushed

Stratum II 7.5YR 4/3 (brown) loamy sand with 50% gravel [7.5YR 7/6 (reddish yellow) and 10YR 8/1 (white)]

Stratum III 7.5YR 3/3 (dark brown) loamy sand with 75% gravel [(7.5YR 7/6 (reddish yellow to pale) 10YR 8/1 (white)]

Stratum IV 5YR 5/8 (yellowish red) clayey sand with 75% gravel [7.5YR 7/6 (reddish yellow)]

Stratum V 7.5YR 3/1 (very dark gray) clay with 7.5YR 4/6 (strong brown) mottling



Schematic view of trenches showing profile location

Figure 27. Trench 2 profile of north wall.

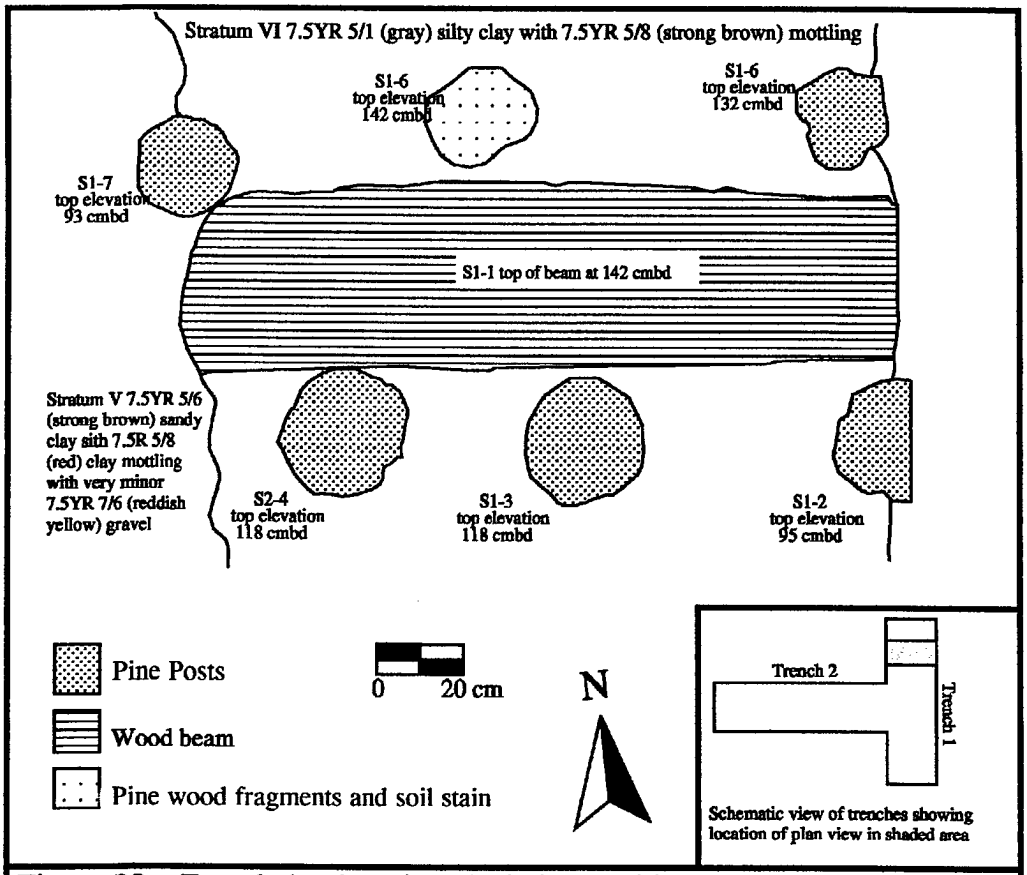


Figure 28. Trench 1, plan view depicting positions of structural elements. Bottom of trench is at 142 cmbd.

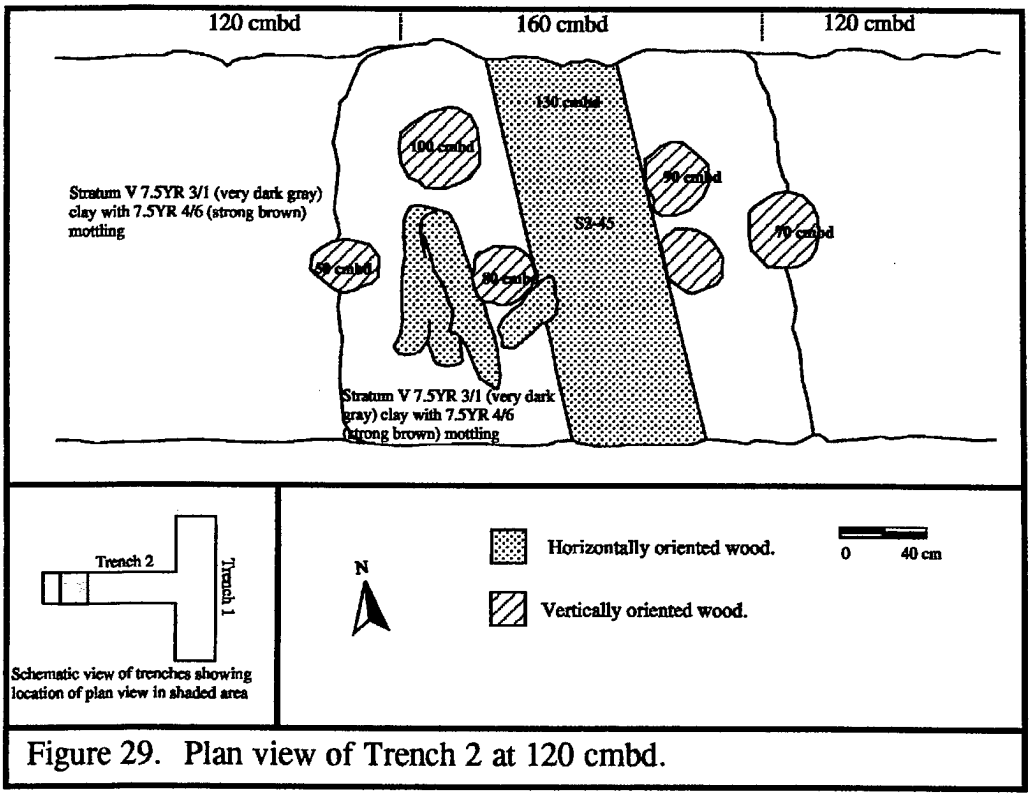


Figure 29. Plan view of Trench 2 at 120 cmbd.

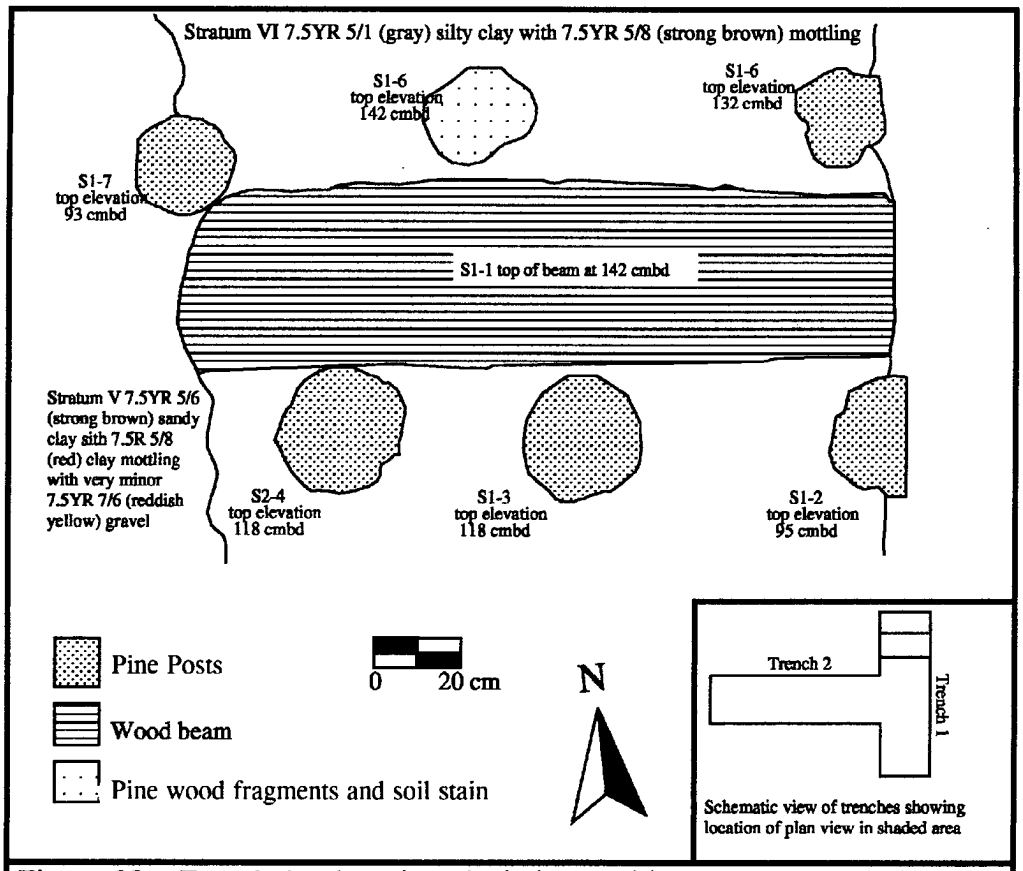


Figure 28. Trench 1, plan view depicting positions of structural elements. Bottom of trench is at 142 cmbd.

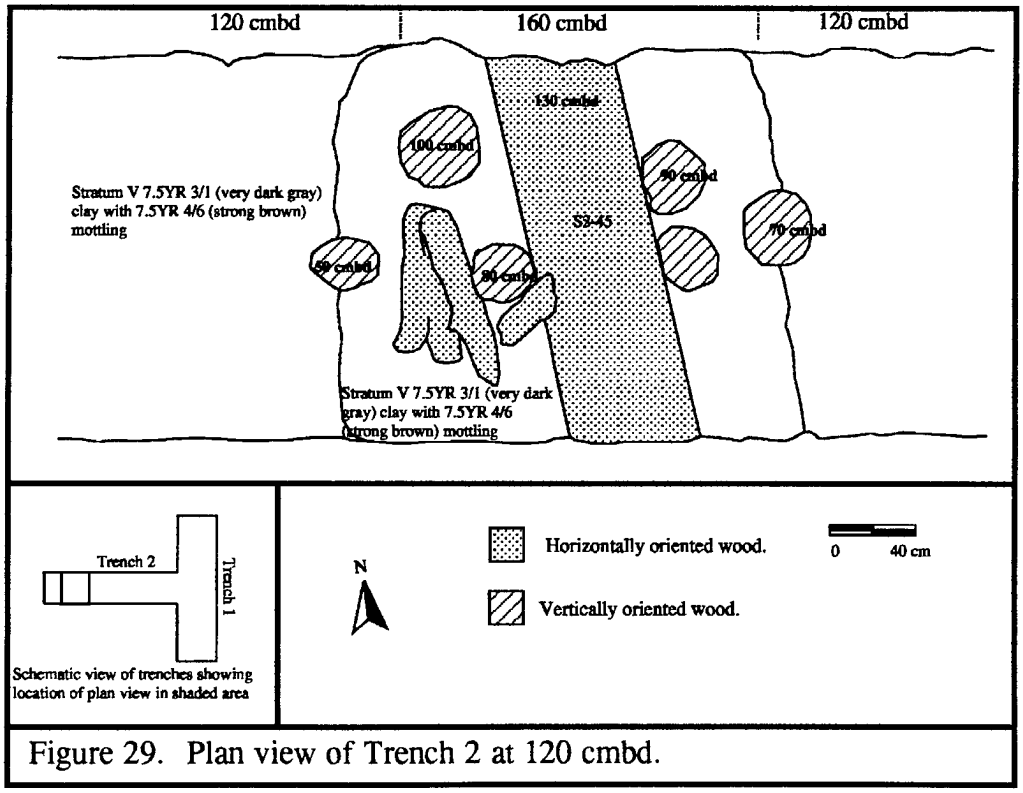


Figure 29. Plan view of Trench 2 at 120 cmbd.

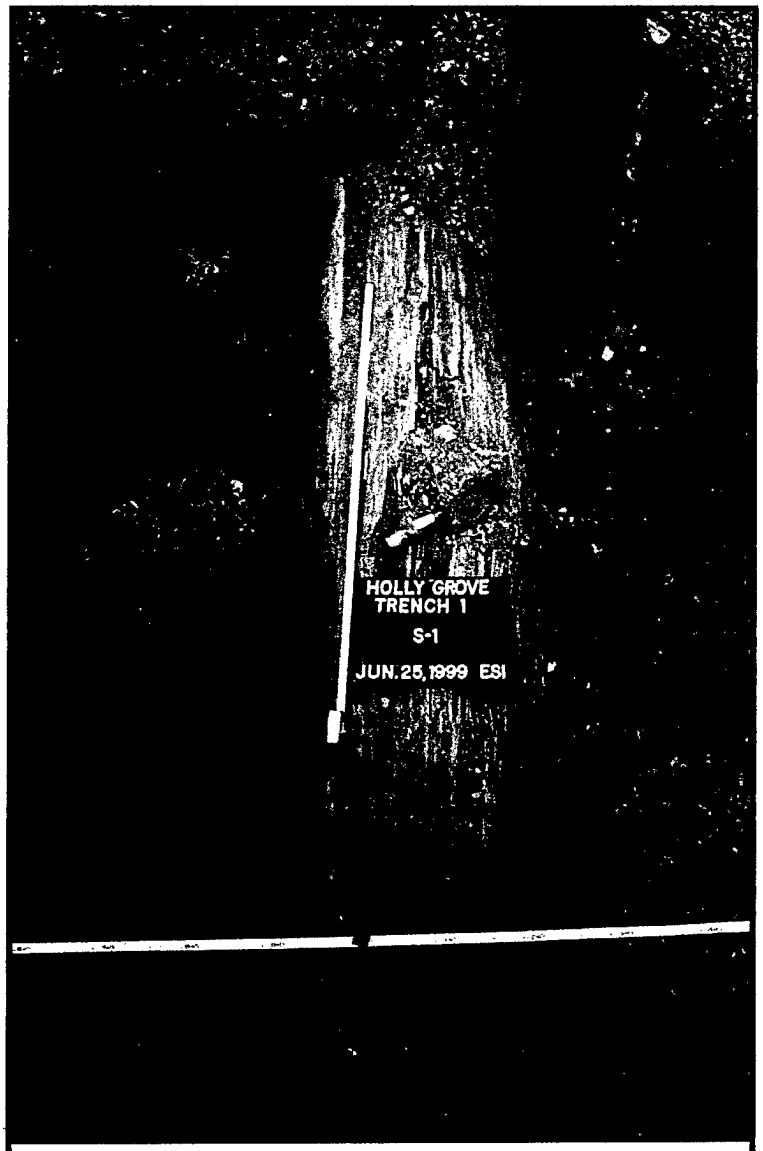


Plate 1. Photograph of Trench 1, Feature S1-1.

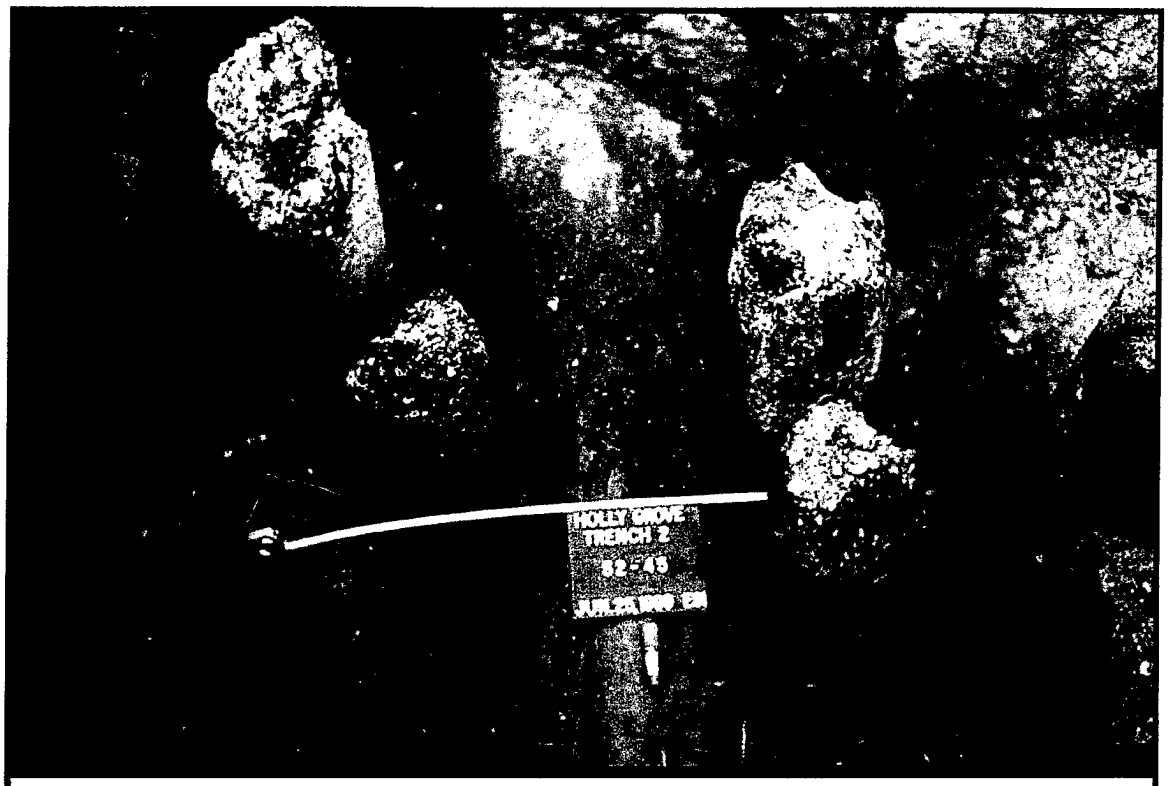


Plate 2. Photograph of Trench 2, Feature S2-45.

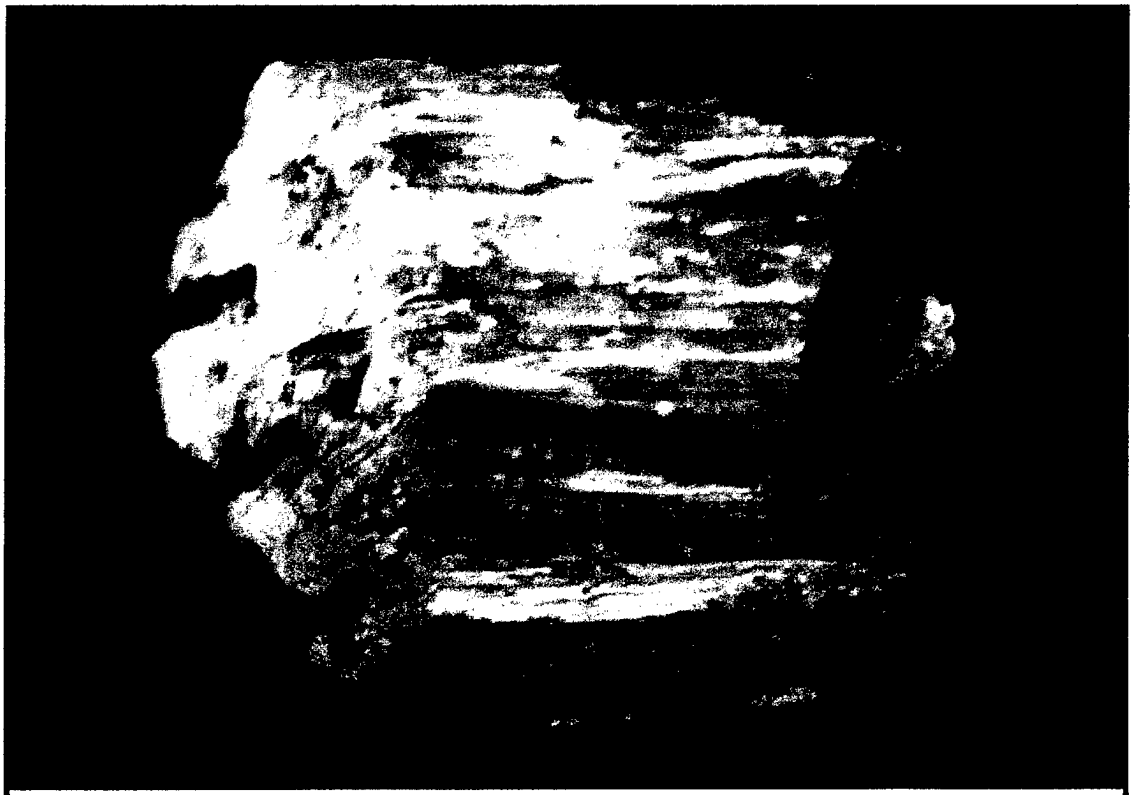


Plate 3. Photograph of wood chip recovered fromTrench 4, Segment 3.

Table 2. Wood Specimens Identified from Hollygrove.

Provenience	Pinus spp. (yellow/hard pine) count/weight	Taxodium distichum (bald cypress) count/ weight
Trench 3, Segment 3, charred wood from notched log		1/4.95g
Trench 2, S2-45 Area, Chip sample		1/9.76g
Trench 1, S1, Vertical Post Sample	1/9.78g	
Trench 5, S2-7		*1/3.96

* sample *tentatively* identified as *T. distichum*. Wood eroded and minute structure deteriorated, obscuring key features.

comprised the swamp floor antedating the drainage of the swamp. Since the Hollygrove area was a cypress swamp until the twentieth century, cypress was the logical and expedient construction material. Pine would have been imported, possibly from as far away as north of Lake Pontchartrain. It is unclear why pine was utilized in conjunction with the cypress beam S1-1.

Besides the cypress wood chips around the vicinity of S2-45, no artifacts were recovered from the feature-bearing Stratum V. Artifacts recovered from overlying strata were mixed (see artifact discussion, below). For example, modern trash was found with an 1880s-to-mid-twentieth-century case bottle fragment in Trench 1, Stratum I, within the first 30 cmbs (11.8 in).

Trenches 3 and 4. Trenches 3 and 4 were excavated immediately to the east of the intersection of Oleander Street. and the railroad embankment (Figure 30). This location was chosen primarily because of its proximity to the historic Oleander Canal, constructed in 1871. It was hypothesized that there might be remains of the canal crossing preserved here, such as pilings for a bridge. Trench 3 was excavated perpendicular to the embankment. It measured approximately 8 m (26.2 ft) long and 2.6 m (8.5 ft) wide. The center of the trench extended to a maximum depth of 2.6 m (8.5 ft). Excavation continued until wood features, comprised of horizontal logs or beams placed parallel to the embankment, were encountered. Trench 4 was then excavated at the center of the embankment in hopes of uncovering historic cribbing/trestle work that was presumed, based on the archival record, to have been placed there in the nineteenth century. This trench measured approximately 20 m (65.6 ft) in length and 1.5 m (4.9 ft) in width. It was generally excavated to a depth of 1.5 m (4.9 ft). Three segments of the trench containing wooden features associated with the embankment were excavated separately and to a greater depth.

Soils in Trench 3 (Figure 31) consist of an upper layer of 5Y 2.5/1 (black) sandy loam with similarly-colored crushed gravel. Stratum II is a large fill layer of 2.5Y 3/2 (very dark grayish brown) sandy loam with 7.5YR 6/8 (reddish yellow) gravel that comprises approximately 75 percent of the stratum. Stratum II extends to approximately 2 m (6.6 ft) below the surface of the embankment. Stratum IIA and IIB are only present on the down slope of the embankment, where they occur above the Stratum II proper. Stratum IIA is a layer of 7.5YR 6/8 (reddish yellow) sand mottled with 2.5Y 7/8 (yellow) sand containing gravel of the same color; the gravel comprises approximately 75 percent of the stratum. Stratum IIB, below Stratum IIA, is virtually identical to Stratum I. Below Stratum II is Stratum III, the horizon of the swamp originally located within the Hollygrove area. This last stratum is a 2.5Y 3/1 (very dark gray) clay and included *in situ* cypress knees.

As was the case in Trench 1, the Trench 3 profile shows a concavity in the clay Stratum III. Again, this subsidence or depression in the stratigraphy was most likely caused by heavy trains continuously passing over the embankment.

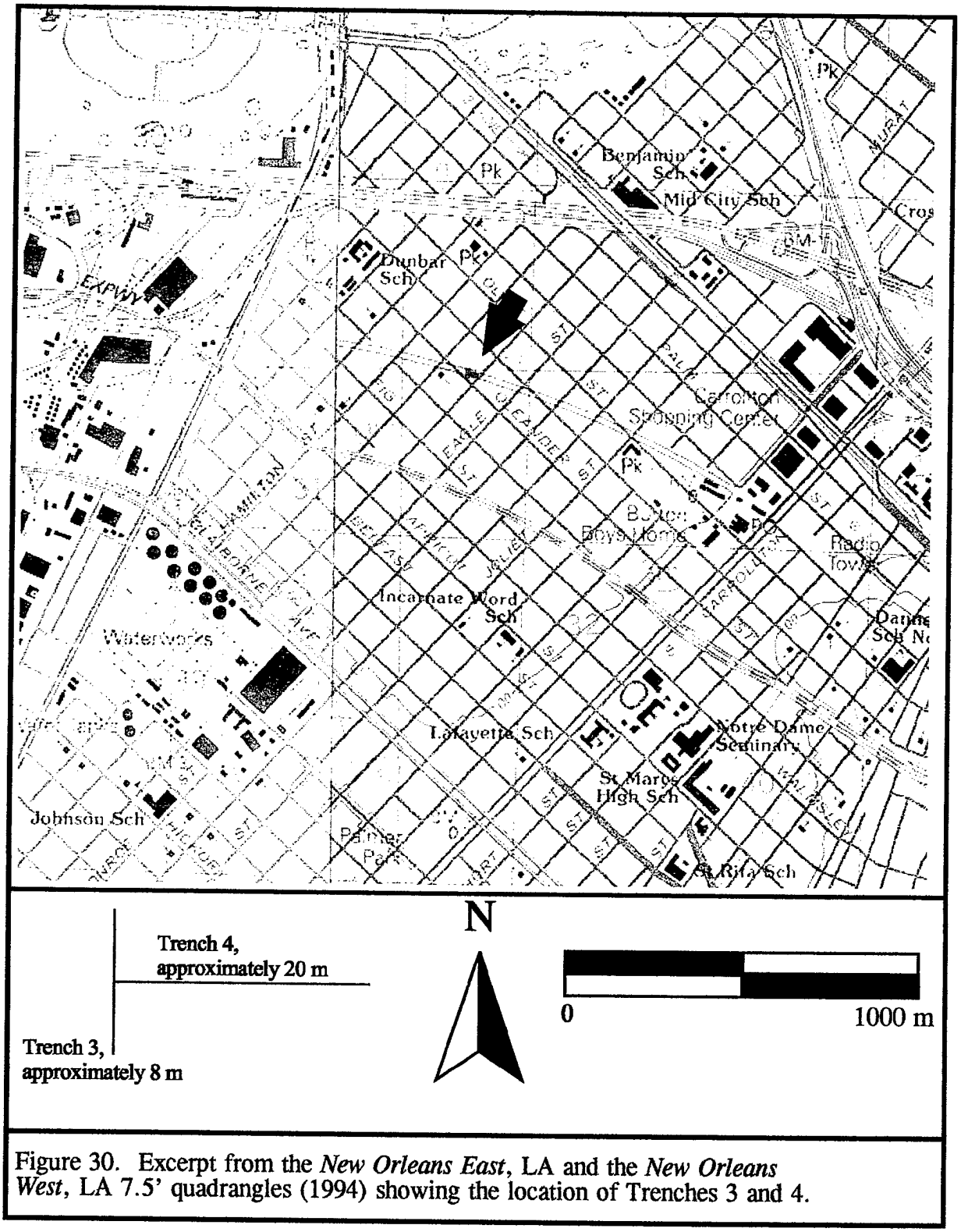
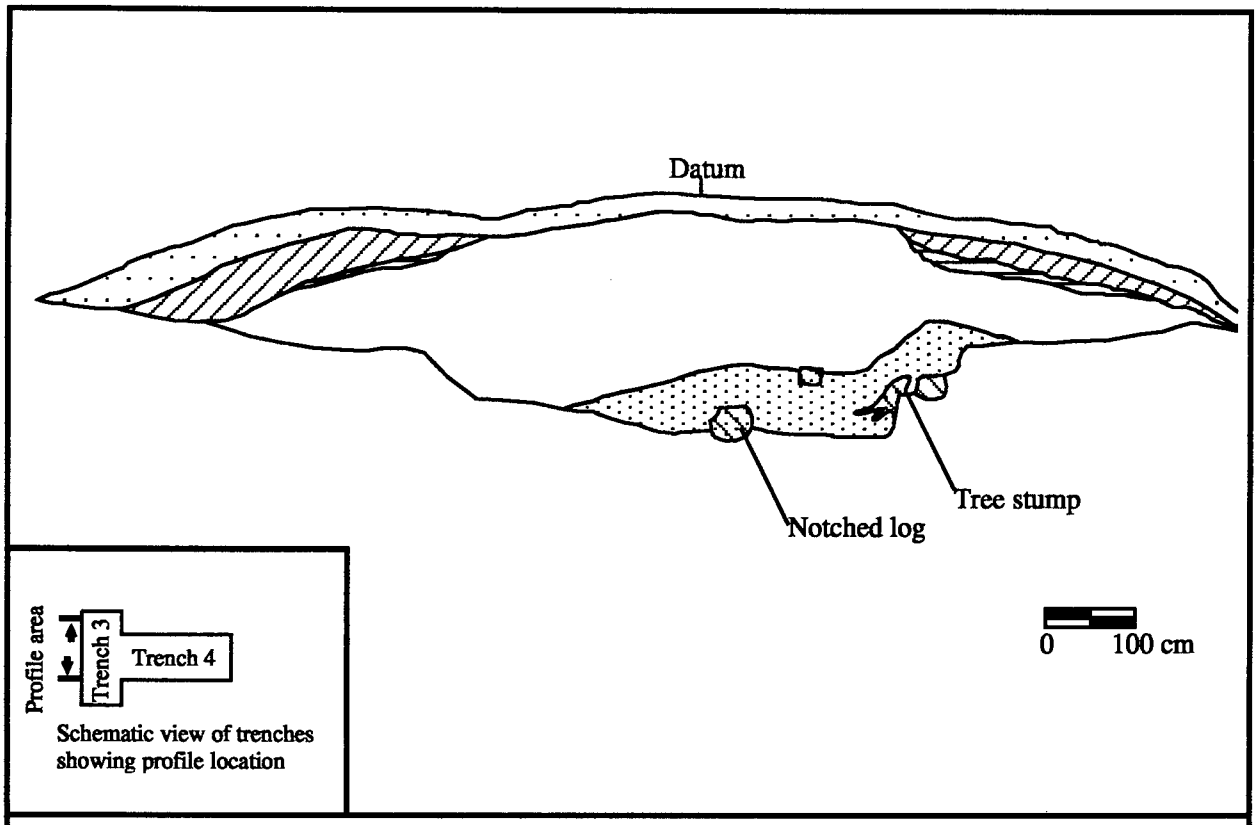


Figure 30. Excerpt from the *New Orleans East*, LA and the *New Orleans West*, LA 7.5' quadrangles (1994) showing the location of Trenches 3 and 4.



Stratum I 5Y 2.5/1 (black) sandy loam with crushed gravel.

Stratum II 2.5Y 3/2 (very dark grayish brown) sandy loam with 75% gravel [7.5 YR (yellowish red)]

Stratum IIA 7.5YR 6/8 (reddish yellow) sand mottled with 2.5Y 7/8 (yellow) and coarse gravels

Stratum IIB 5Y 2.5/1 Black) Sandy loam with crushed gravel

Stratum III 2.5Y 3/1 (very dark gray) clay

Figure 31. Trench 3, west profile.

Trench 4 had similar stratigraphy (Figure 32). Stratum I is a thin layer of 5Y 2.5/1 (black) sandy loam with crushed gravel of the same color. Stratum II is a thick layer of heterogeneous fill containing approximately 75 percent gravel. It contains a mixture of 2.5Y 3/2 (very dark grayish brown) sandy loam with gravel of the same color, 5YR 5/8 (yellowish red sandy clay) with gravel of the same color, and 2.5Y 4/4 (olive brown) sandy clay with 5YR 5/8 (yellowish red) gravel. This heterogeneous fill extends to approximately 1.4 m (4.6 ft) below the surface of the embankment. Beneath it is Stratum III, a layer of 2.5 Y 3/1 (very dark gray) clay.

All features were unearthed in Stratum III. Unlike the first two trenches, no pilings were found in this area; all wooden features are horizontal. As noted above, these features were excavated in three segments. Segment 1 was located in the eastern portion of Trench 4 (Figure 33). A preponderance of the wood was uncovered during mechanical excavation in this section of the trench. Hand excavation unearthed wood to a depth of approximately 1.9 m (6.2 ft). Segment 1, measuring 2.0 m (6.6 ft) in length, was excavated to a total depth of 2.1 m (6.9 ft). Two very large logs lie horizontal and roughly parallel to the embankment. In the northwest corner of Segment 1, there are many smaller tree limbs lined together with possible planks extending across them (Figure 33).

Segment 2 was similar in size and depth to Segment 1. It was excavated to a depth of 2.0 m (6.6 ft), and it was approximately 1.7 m (5.6 ft) in length (Figure 34). Segment 2 was excavated because a large log or beam was uncovered in the south wall of Trench 4 during mechanical excavation. The log appeared to be hollowed or rotten, since the portion facing the trench is concave. A squared-off piece of wood is west of and overlying the log (Figure 34). No other wooden features or artifacts were found in this segment.

The last and most productive area of Trench 4 was Segment 3 (Figure 35). It was also the largest area excavated. Segment 3 began in the western portion of Trench 4. Excavation of the segment followed the wooden features into Trench 3. The segment was approximately 9 m (29.5 ft) in length and 1-4 m (3.28-13.1 ft) wide. All wooden features within this segment were exposed at a depth lower than 1.5 m (4.9 ft) below datum and within Stratum III. No other cultural debris was unearthed in Stratum III.

The *in situ* wooden features in Segment 3 consist of large logs placed parallel to the embankment, similar to those seen in Segments 1 and 2. There are also wooden components that appeared to have been placed across the larger logs. A squared beam measuring approximately 10 cm (3.9 in) wide was unearthed immediately to the east of the interface of Trenches 3 and 4. A rectangular notch is located on top of this beam (Plate 4); and planks protrude from below the beam (Plate 5). In addition, a plank in Segment 3 appears to have square holes (Plate 6), possibly from nails.

It is possible that these features may be the remains of cribbing formerly located in this area. The specifications for nineteenth century cribwork called for squared beams saddled together. The notch itself would have been the saddle on which the rest of the interlocking square beams would have been laid. The notch on the beam has no marks or nails in it. Given that the planks and cross-logs are underneath this notched beam, it seems that the beam is *in situ,* and may represent only the very bottom of the cribbing formerly located here.

A second notched log was noted in Trench 3; however, it was not associated with cross planks (Plate 7). Additionally, no wooden pieces that could fit around or in the notch were observed in the vicinity. This notched log may have been laid for stabilization, as opposed to being a part of cribbing.

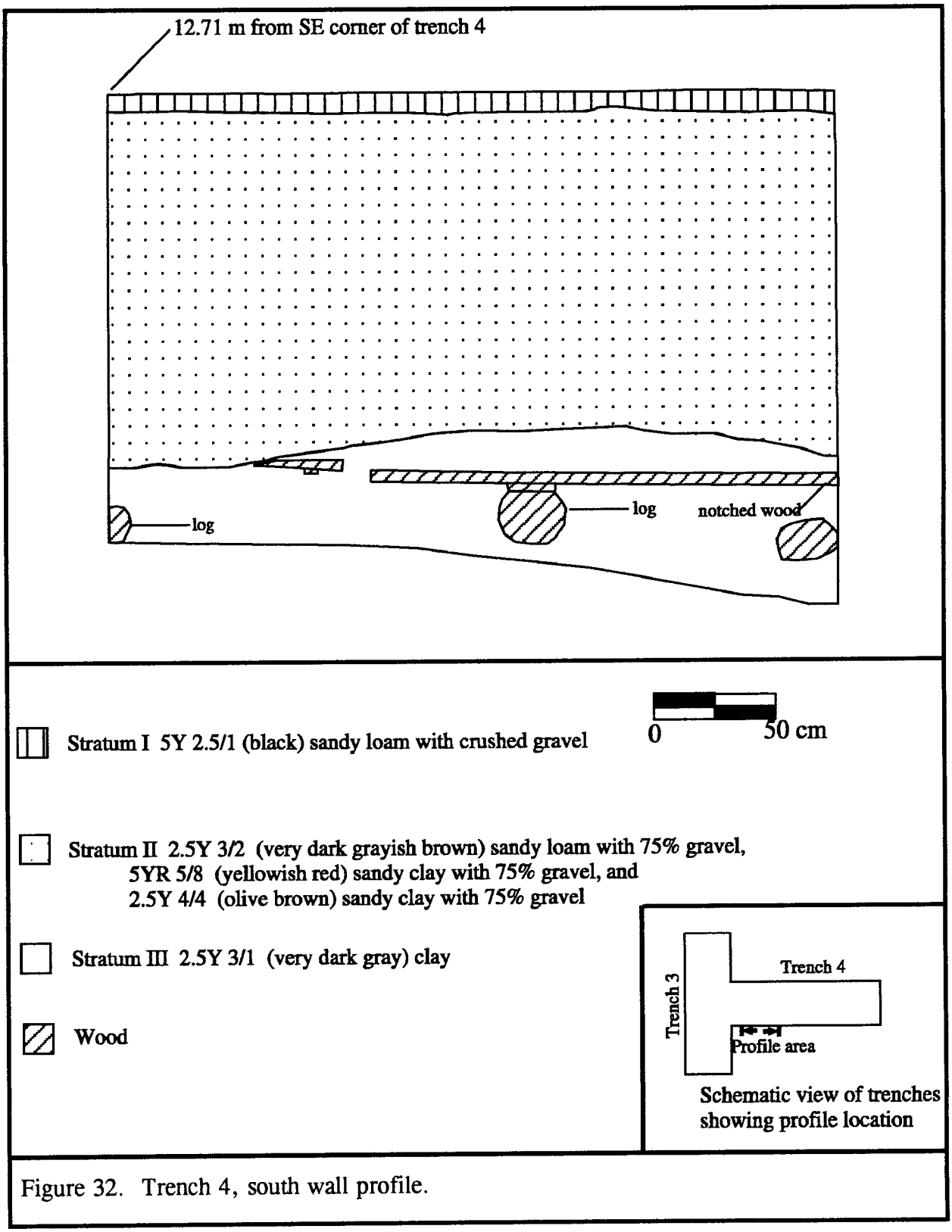


Figure 32. Trench 4, south wall profile.

Much construction and reconstruction occurred in this area of the embankment (see Chapter 5). The Oleander Canal, excavated ca. 1871, was filled in decades later. At this time, the embankment in this area was reconstructed. While the single beam and the associated planks are meager evidence of cribwork, it is possible that the rest of the cribwork was destroyed during the construction and deconstruction of the Oleander Canal.

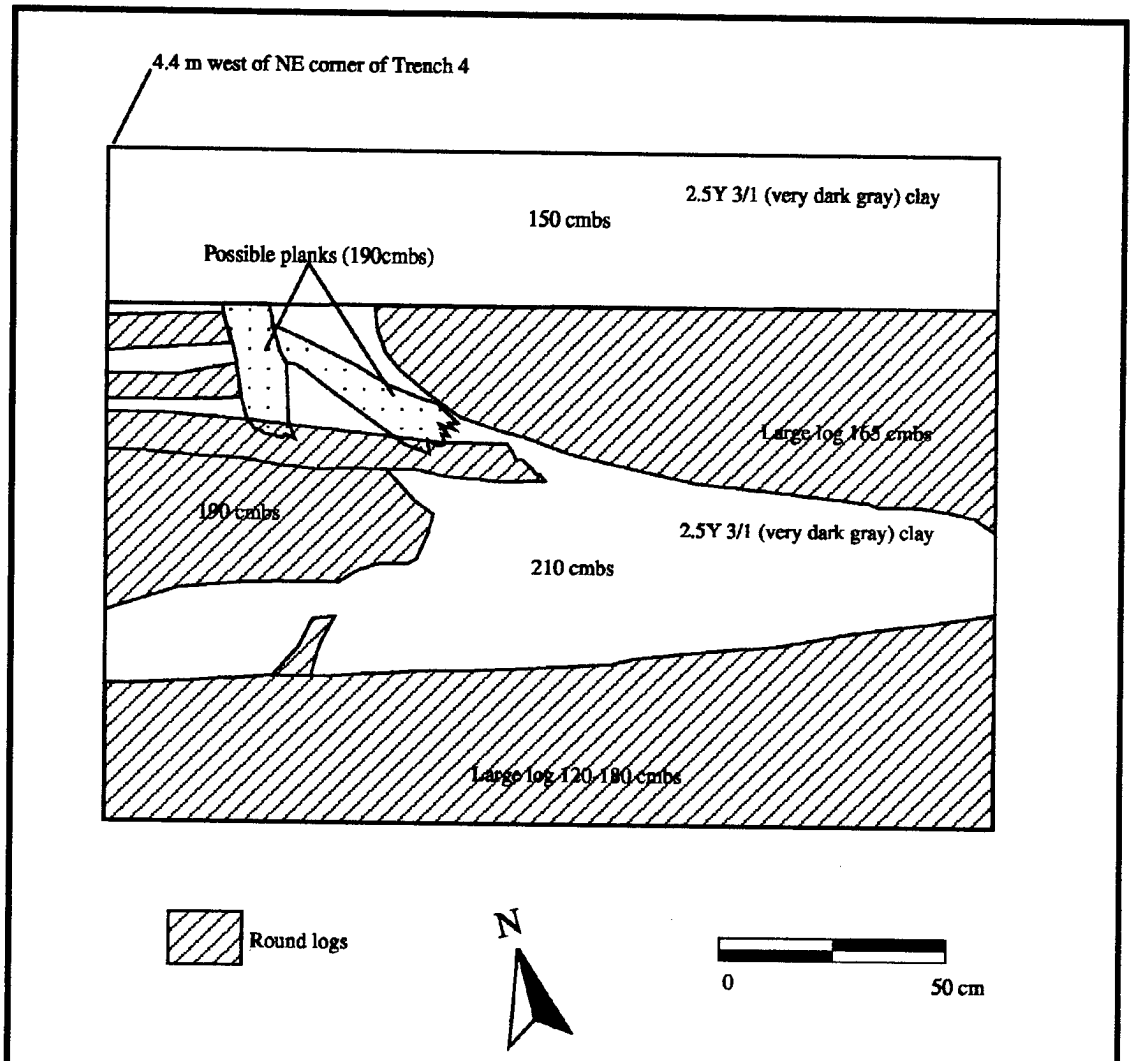


Figure 33. Trench 4, Segment 1, plan view.

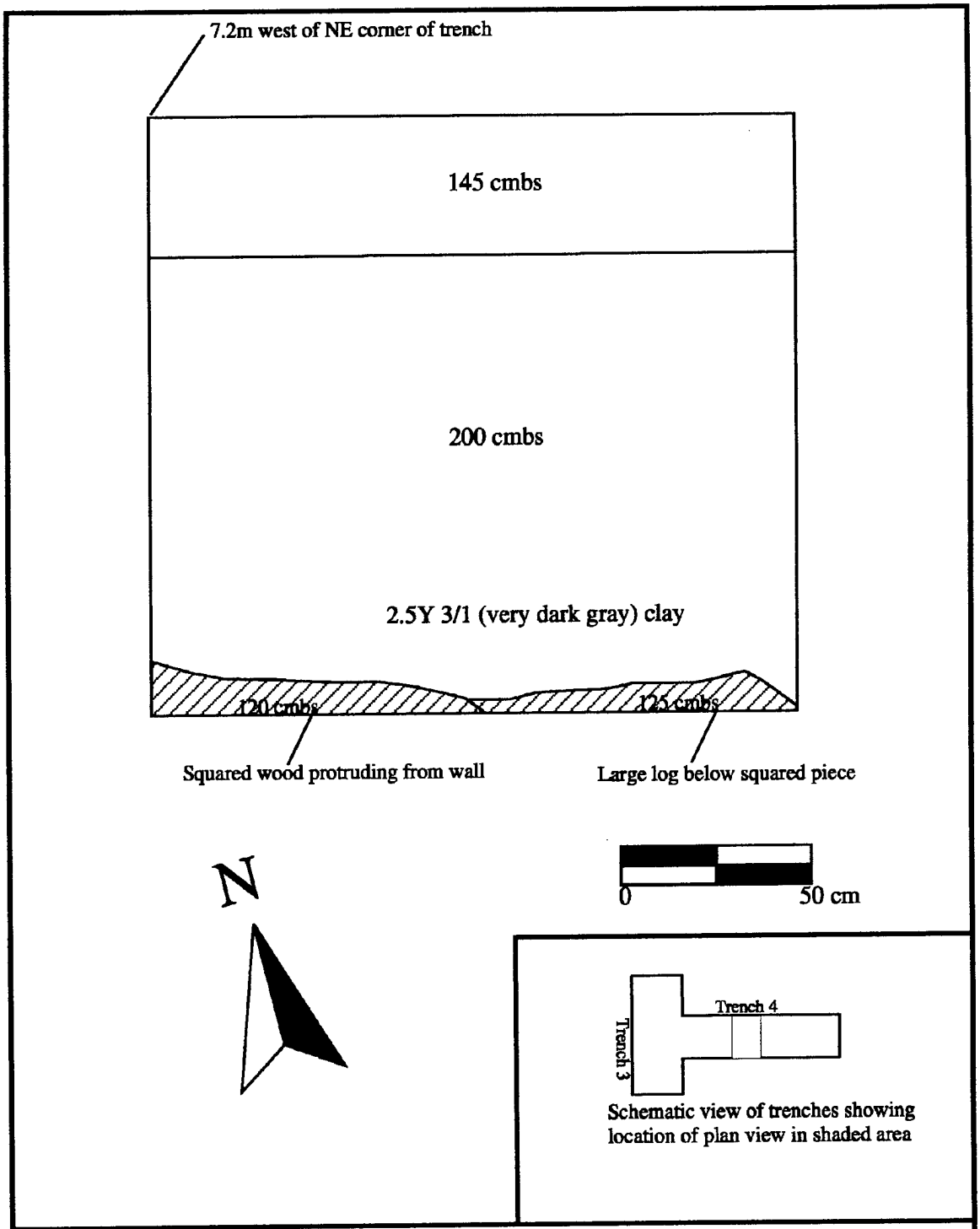


Figure 34. Trench 4, Segment 2, plan view.

Alternatively, and far more likely, cribwork was never utilized in the project area to support the railroad crossties, and the seeming association of the notched beam and planks is spurious. Presumably if a portion of the base of the cribwork survived in this area, there would have been evidence of cribbing elsewhere as well, including more than two notched logs and possibly drift bolts for securing the timbers. This is particularly the case since the wooden features within Segment 3 appear undisturbed (see below), despite the presumed multiple con-

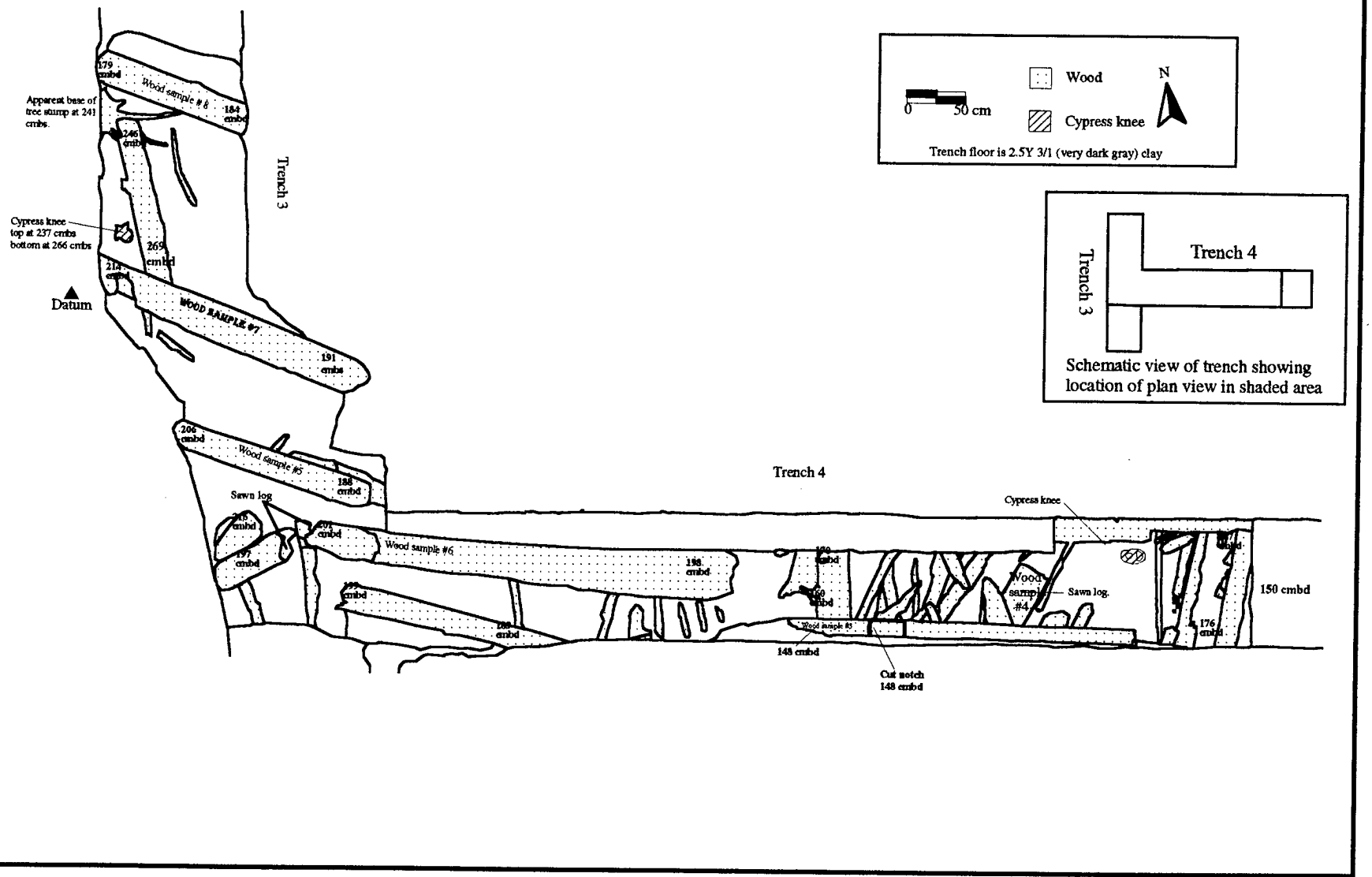


Figure 35. Plan view of Trenches 3 and 4, Segment 3.

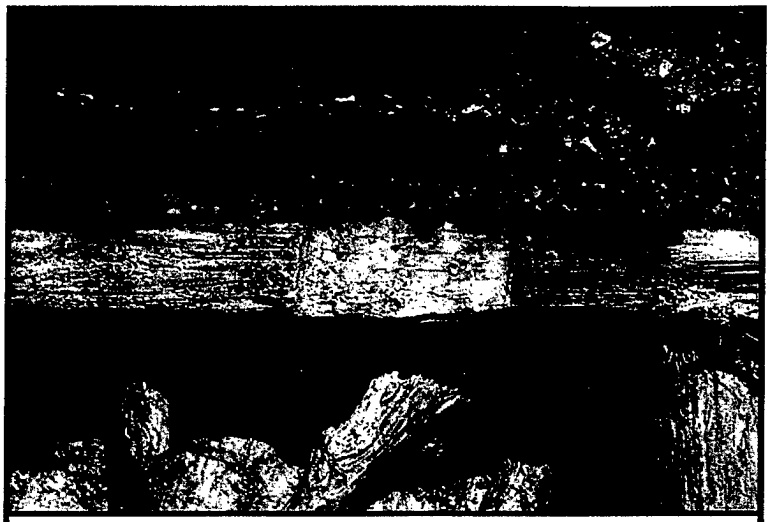


Plate 4. Photograph of square notched beam in Trench 4, Segment 3.

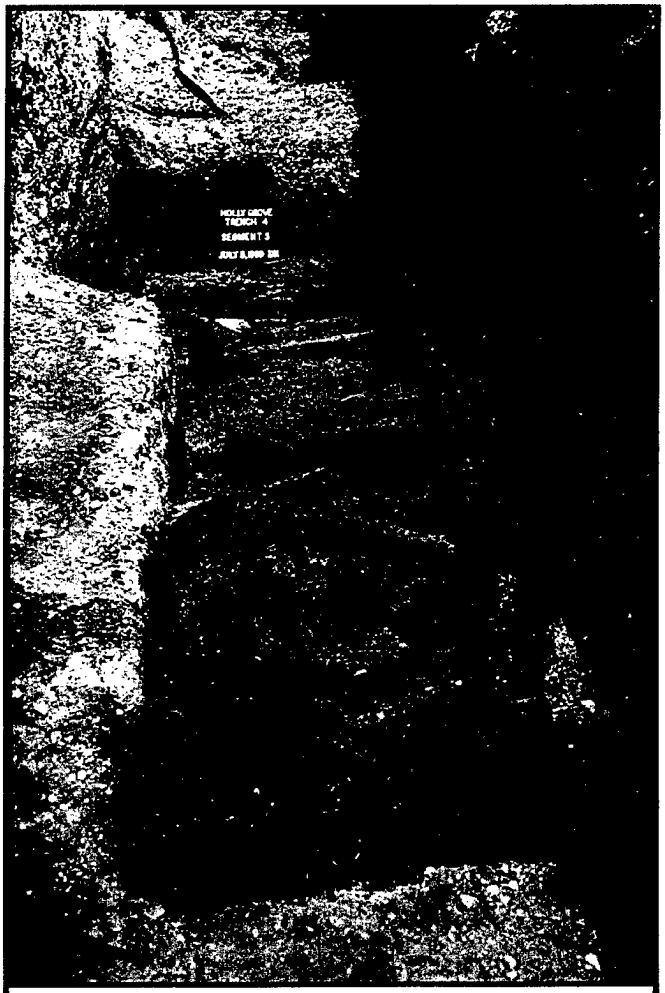


Plate 5. Photograph of Segment 3, wooden structural feature.

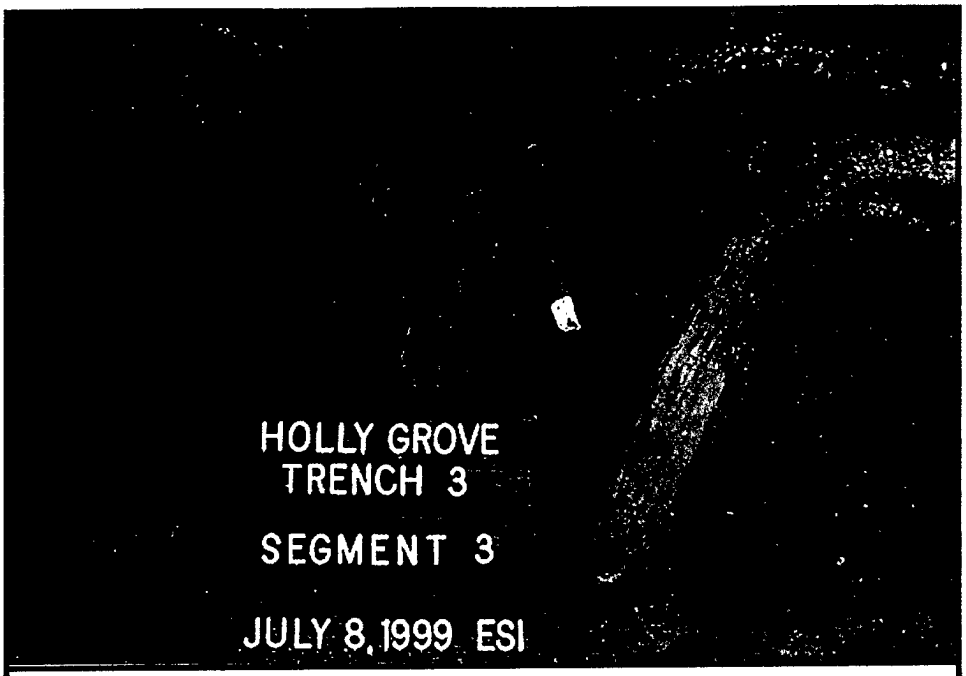


Plate 6. Photograph of plank with square holes in Segment 3.

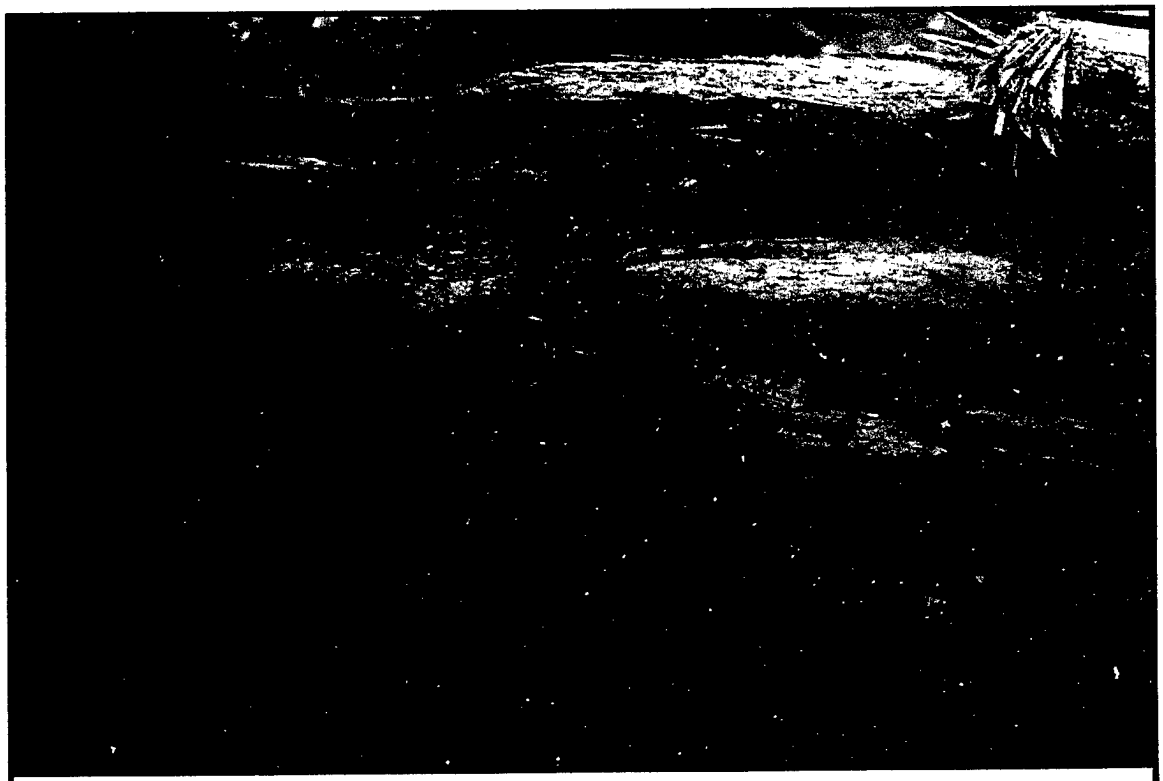


Plate 7. Photograph of notched log in Segment 3, Trench 4.

struction episodes in this portion of the embankment. If cribbing were never utilized within the embankment within the project area, then the various horizontal logs, planks, and other timbers seen in Segment 3 as well as elsewhere along the embankment are the products of clearing the way for the railway. The felled timbers, as well as other debris from clearing, served as a base to stabilize the earthen embankment. Perhaps significantly, there is no evidence in the work contracts for grubbing along this portion of the railway.

Whatever the function of these wood features, they represent the first building episode on this site. The stratigraphy shows all of the wood remains imbedded in the gray Harahan clay that underlies the Hollygrove neighborhood. That clay represents the remains of the swamp located in the area prior to drainage. Numerous cypress knees and stumps were observed at the same level as the wooden features (Plate 8). Thus, the features here in Segment 3 are the most intact remains of the original railroad construction found at the site. Unfortunately, as was the case in Trenches 1 and 2, no artifacts were recovered in the clay Stratum III that held the wooden features.

The only artifacts recovered from Trenches 3 and 4 were from the disturbed top strata, which contained artifacts ranging in date from early- to mid-twentieth century to the late-twentieth century. These include a Coke bottle dating from 1973 and a Wells (1998) Type 8 (1820-1891) nail. This late-nineteenth-century date for the latter is consistent with the building of the Oleander Canal.

Trenches 5 and 6. After the completion of Trenches 3 and 4, mechanical sampling was undertaken throughout the project area (see below). The locations of Trenches 5 and 6, in the extreme western portion of the project area (Figure 36), were chosen because this sampling, initially, revealed as much or more wooden structural remains than any of the other areas probed. Trench 5 measured approximately 12 m (39.4 ft) in length and was approximately 2 m (6.6 ft) in width. It was excavated to an average depth of 1.5 m (4.9 ft). Once wooden features were located during mechanical excavation at approximately 1.25 m (4.1 ft) below datum, the trench was leveled for hand excavation.

Before beginning Trench 6, an area immediately to the south of the row of pilings uncovered in Trench 5 was excavated 2 m (6.6 ft) below the surrounding trench floor (Figure 37). Since no cross beams had been found prior to this in Trench 5, it was speculated that there might be some present at greater depth. Nothing was found. Trench 6 was then excavated parallel to the embankment and north of its crest in order to follow the trajectory of feature S2-10 (Figure 38). Trench 6 measured approximately 18 m (59.0 ft) in length and 1.5 m (4.9 ft) in width. Trench depth averaged 1.5 m (4.9 ft) except in one area adjacent to S1-11 and S1-12 (Figure 39). As was the case in Trench 5, this area was excavated approximately 2 m (6.6 ft) deeper than the surrounding trench in an attempt to locate deeply buried features. No cultural material was unearthed in this area.

The complicated stratigraphy of Trench 5 consists of many thin lenses and a very disturbed area near the center of the embankment (Figure 40). Stratum I is a 10YR 3/1 (very dark gray) coarse sandy loam with crushed gravel. Stratum II, below 25 cm (9.8 in), is broken by a disturbance in the center of the embankment. Stratum IIa is a 10YR 5/4 (yellowish brown) coarse sand, while Stratum IIb is 5YR 5/6 (yellowish red) coarse sand. Both are comprised of approximately 75 percent 5YR 5/6 (yellowish red) gravel. Stratum III is also broken by the central disturbance; IIIa is a 10YR 5/6 (yellowish brown) silty coarse sand with mixed gravels, and IIIb is a 10YR 4/4 (dark yellowish brown) loam with mixed gravels. Underneath Stratum III is Stratum IV, a thin lens of 2.5Y /1 (black) sandy loam beginning at approximately 1 m (3.3 ft) below the surface of the top of the embankment. Below this is Stratum V, a thicker layer of 7.5 YR 4/4 (brown) sandy clay loam containing about 25 percent gravel of similar color. At approximately 1.25 m (4.1 ft) below the surface of the top of the embankment, Stratum VI begins. This stratum is composed of a 2.5Y 4/2 (dark grayish brown) Harahan clay.

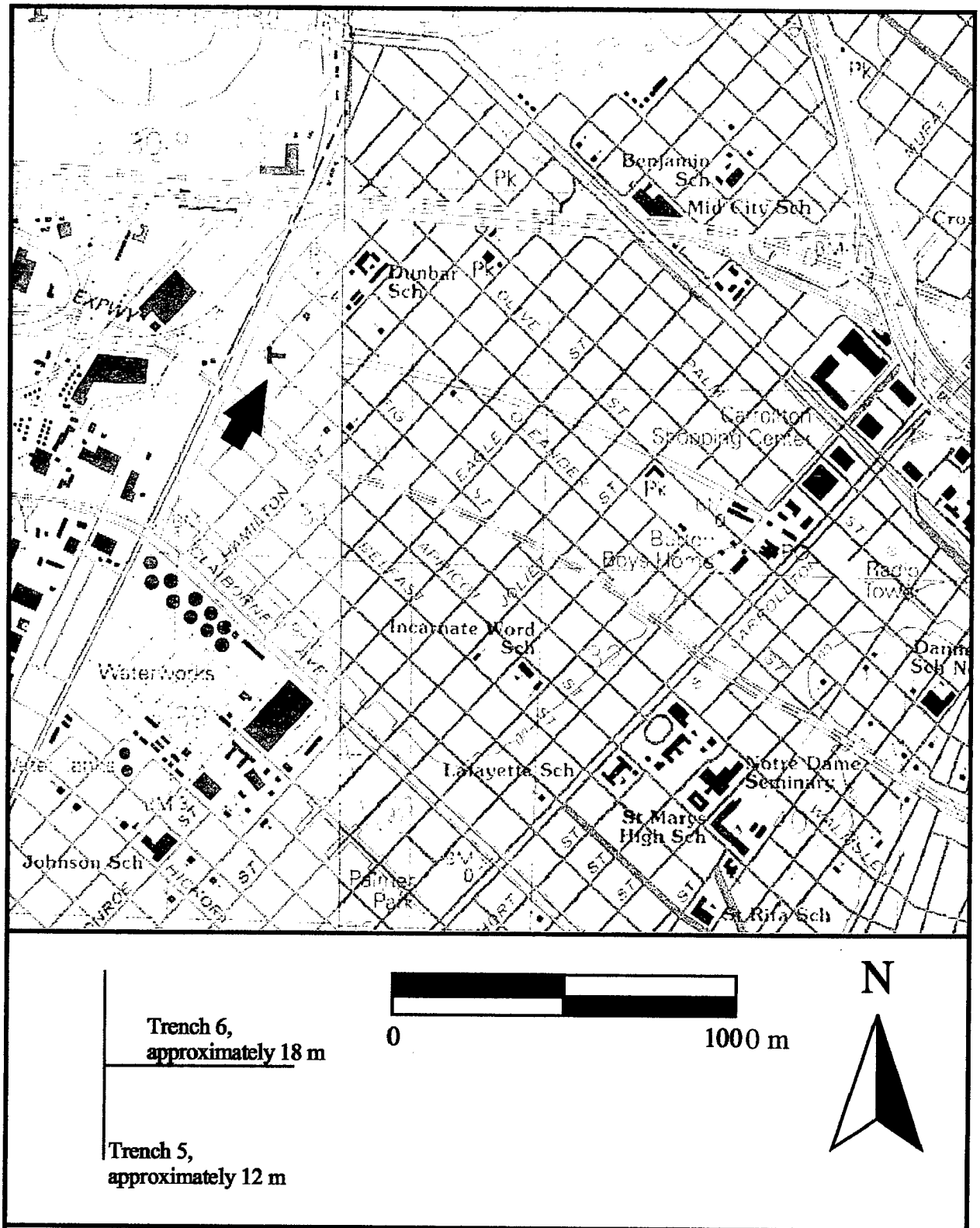


Figure 36. Excerpt from the *New Orleans East* and the *New Orleans West* 7.5' quadrangles (1994) showing the location of Trenches 5 and 6.

Plate 8. Photograph of cypress knees in Trench 4.

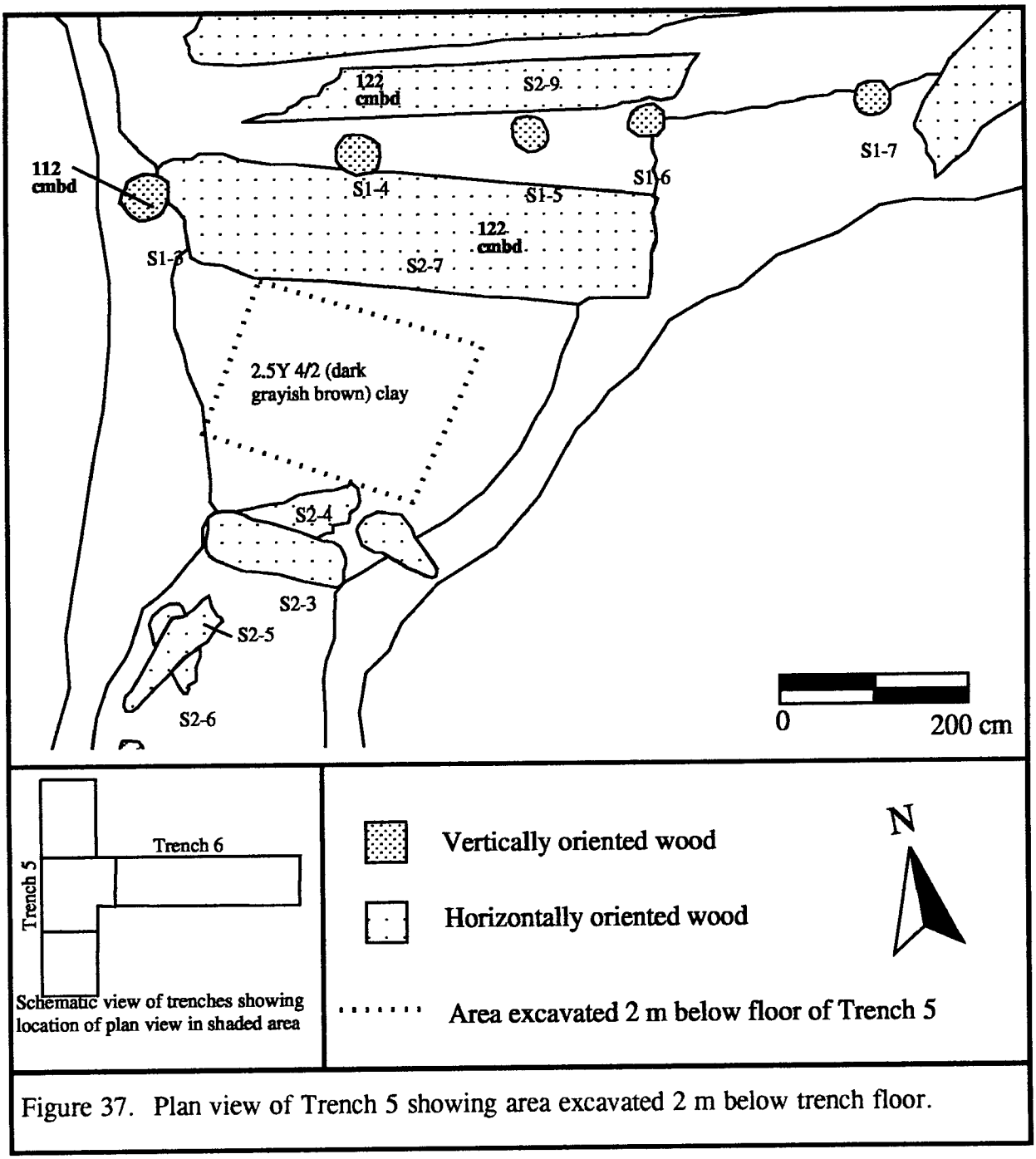


Figure 37. Plan view of Trench 5 showing area excavated 2 m below trench floor.

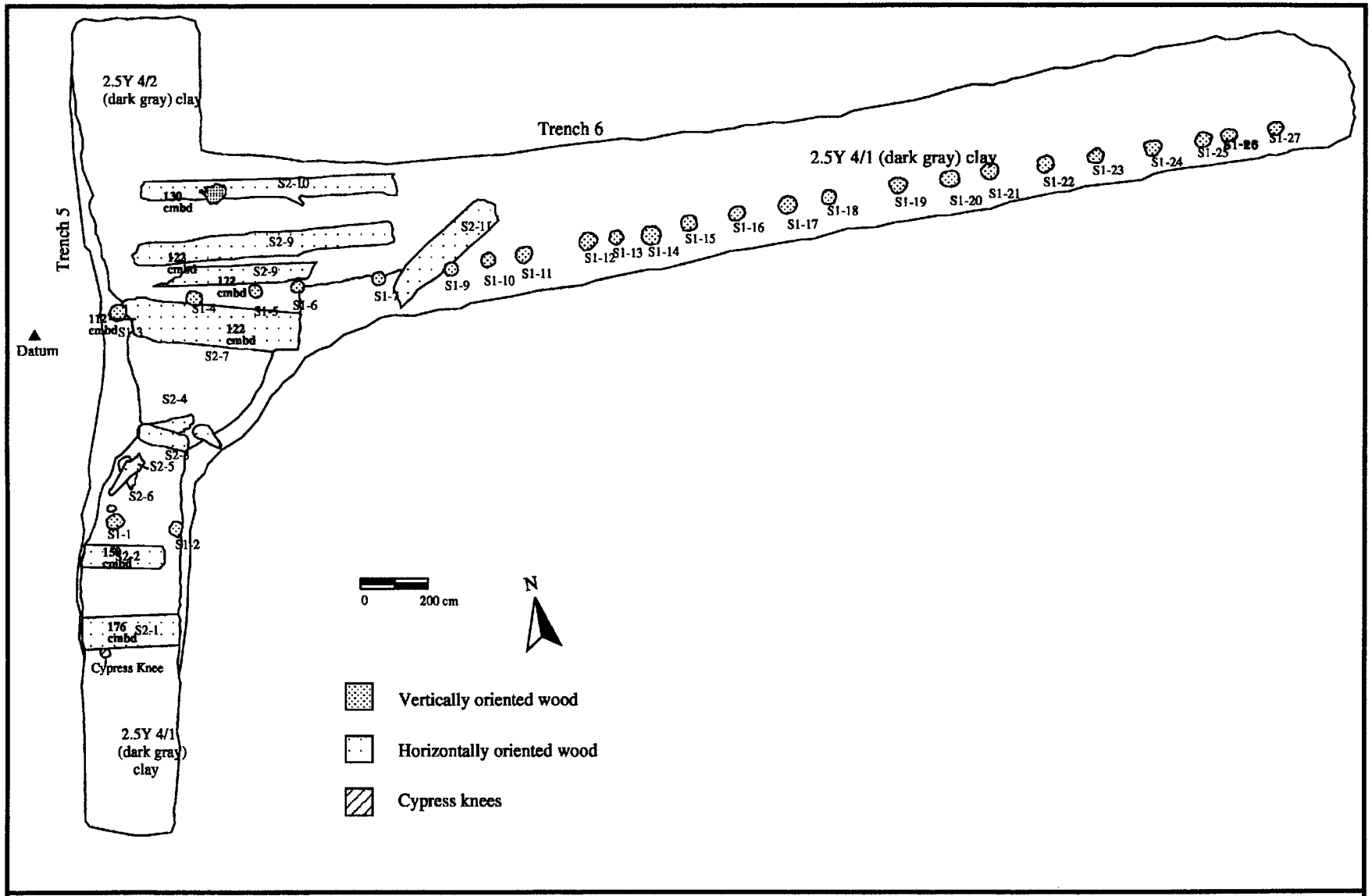


Figure 38. Trenches 5 and 6, plan view.

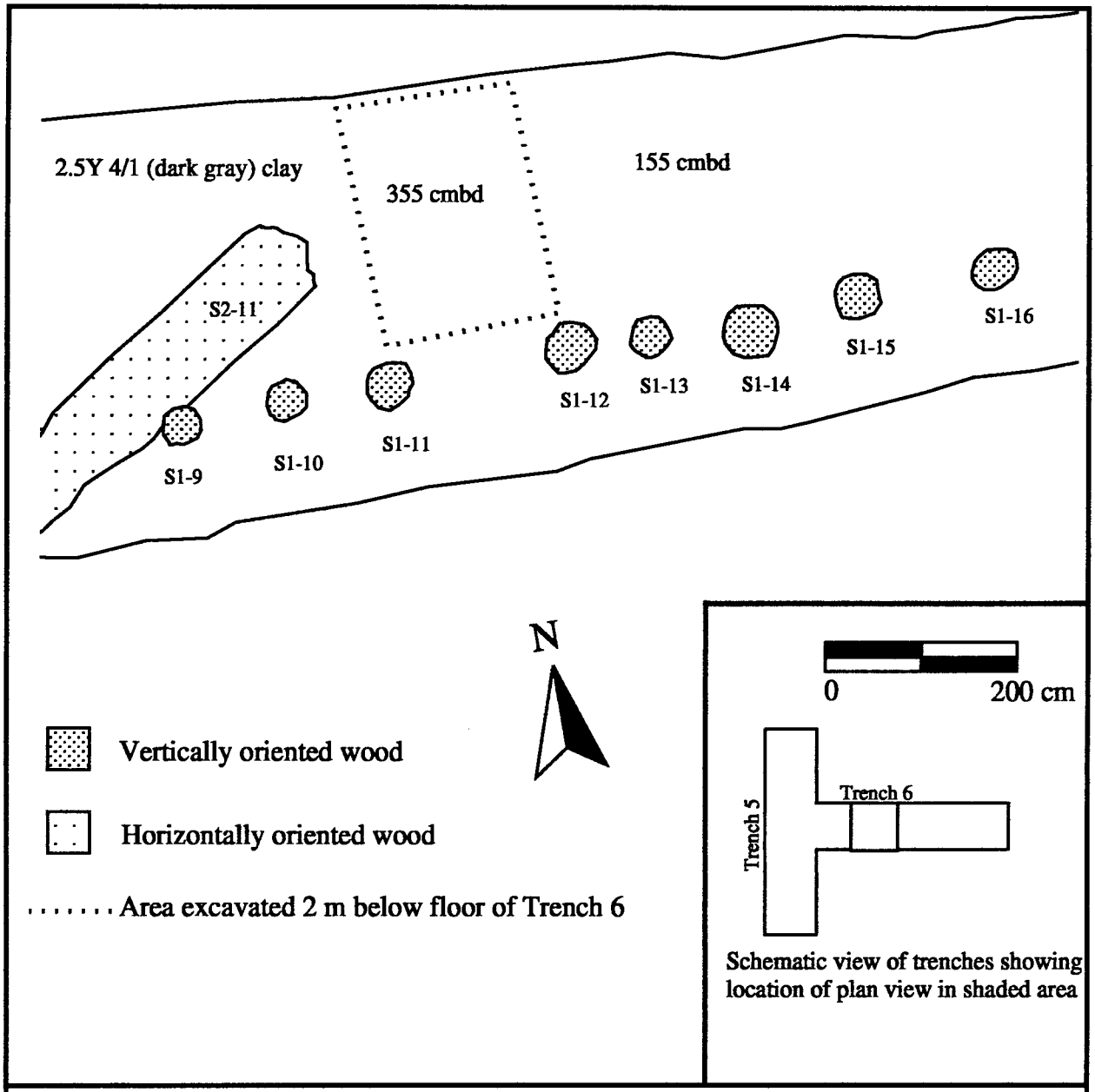
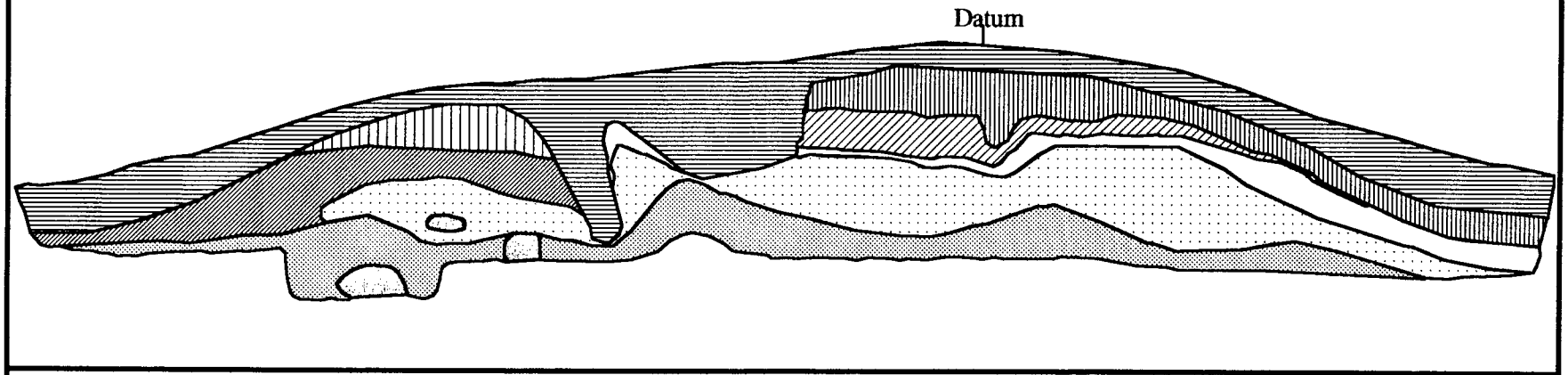


Figure 39. Plan view of Trench 6 showing area excavated 2 m below trench floor.

As was the case in Trenches 1 and 3, the weight of the trains had an effect on the underlying soils. As seen in Figure 40, there is a noticeable concavity in the stratigraphic profile the embankment. Stratum IV is a very thin lens, approximately 5 cm (2.0 in) thick, of 10YR 5/4 (yellowish brown) coarse sand containing 75 percent gravel of similar color. Stratum V is slightly thicker than Stratum IV; it is a layer of 10YR 3/1 (very dark gray) silty coarse sand. The next layer, Stratum VI, is a 7.5YR 4/4 (brown) silty coarse sand containing 75 percent gravel of the color. It extends to approximately 80 cm (31.5 in) below the surface of the embankment. Beneath Stratum VI is Stratum VII, a 20 cm (7.9 in) thick layer of 10YR 4/3 (brown) sandy loam with mixed gravel. Stratum VIII is a 5YR 4/6 (yellowish red) silty clay with minor gravel inclusions of similar color. It extends to approximately 1 m (3.28 ft) below the surface of the embankment. The last stratum, Stratum IX, is a layer of 2.5Y 4/1 (dark gray) clay mottled with 2.5Y 4/3 (olive brown) clay that grades to a 2.5Y 4/1 (dark gray) clay.



Stratum I 10YR 3/1 (very dark gray) coarse sandy loam with crushed gravel

Stratum IIa 10YR 5/4 (yellowish brown) coarse sand

Stratum IIb 5YR 5/6 (yellowish red) coarse sand with 75% gravel [5YR 5/6 (yellowish red)]

Stratum IIIa 10 YR 5/6 (yellowish brown) silty coarse sand with mixed gravels

Stratum IIIb 10YR 4/4 (dark yellowish brown) loam with mixed gravels

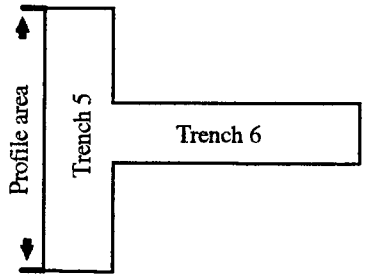
Stratum IV 2.5Y 2.5/1 (black) sandy loam

Stratum V 7.5YR 4/4 (brown) sandy clay loam with 25% gravel [7.5YR 4/4 (brown)]

0 4 m

Stratum VI 2.5Y 4/2 (dark grayish brown) clay

Wood



Schematic view of trenches showing profile location

Figure 40. Trench 5, west wall profile.

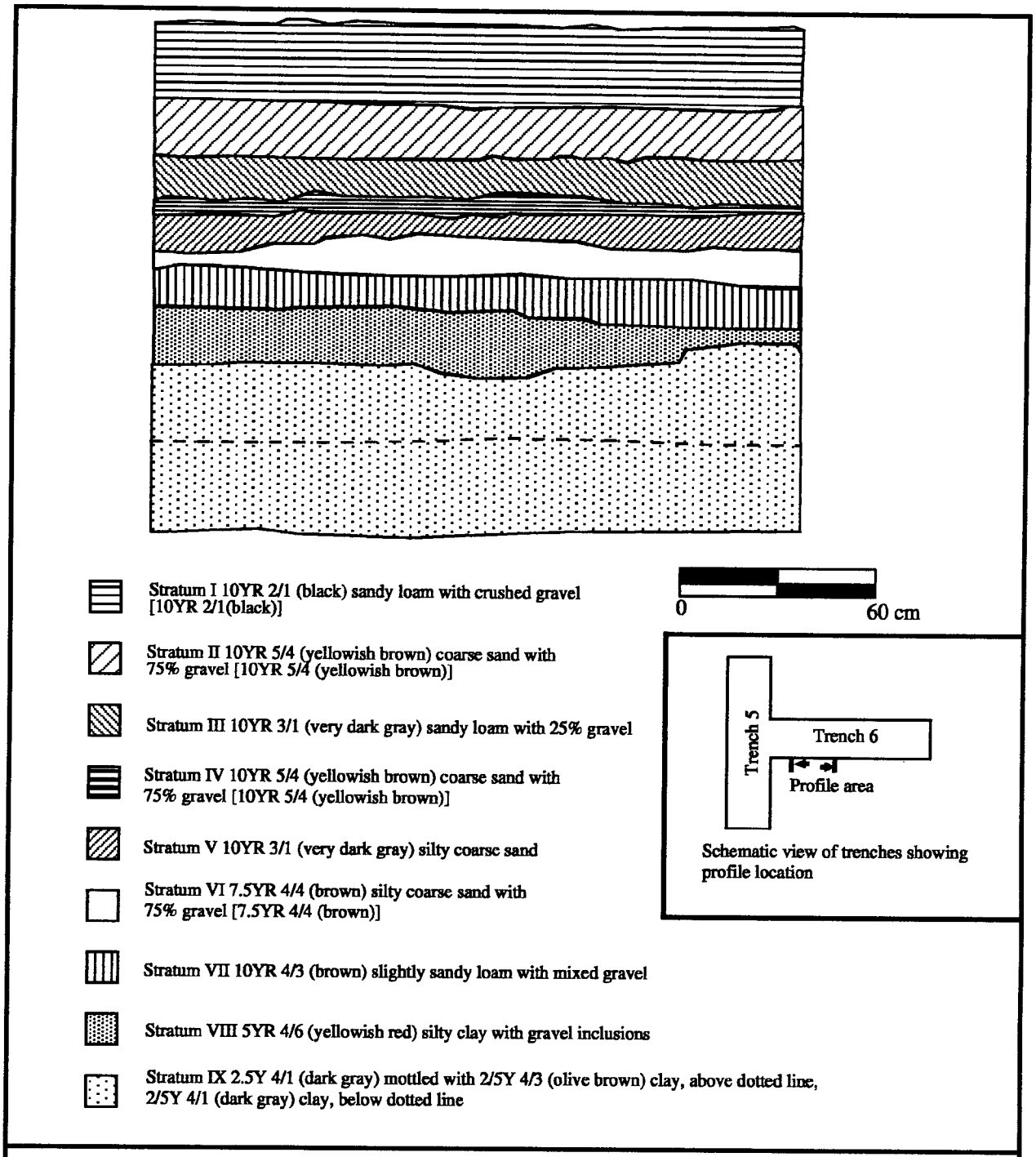


Figure 41. Trench 6, north profile.

It should be noted that the above sequence presents a detailed examination of the micro-stratigraphy in this portion of the embankment. A simplified sequence would include three strata. Stratum I would be the same as mentioned above. Strata II, III, IV, V, VI, VII, and VIII all comprise a generally reddish brown layer of gravelly fill. The third stratum in this simplified scheme would be the last two layers of Harahan clay, which represent the swamp horizon prior to drainage.

A number of wooden structural remains were discovered during excavation of Trenches 5 and 6 (Figure 38 and Plate 9). A row of pine pilings was encountered *in situ* along the southern portion of Trench 6. These pilings, as well as those found in Trenches 1 and 2, and the 18 sampling areas (below), are interpreted as the remains of stabilization efforts. They are believed to be later additions to the embankment which intrude on the earlier wooden features buried in the Harahan Clay. These pilings were placed unevenly, approximately 10 to 75 cm (3.9 to 29.5 in) apart, in a row parallel with the embankment. In the lower stratum of Harahan Clay, around each of the pilings, were small rings of sandy, gravelly yellowish red soils, suggesting that the piles had been driven through the gravelly strata into the clay containing the cypress logs of the original building episode. In addition, obvious disruption to the cypress logs was observed on numerous occasions where the pilings had been driven into them.

To reiterate, the older structural elements of the embankment were thoroughly sealed in the gray clay that underlies the Hollygrove neighborhood. In Trenches 5 and 6, these older structural elements were all horizontally laid. This haphazard placement in roughly parallel rows was undoubtedly for stabilization of the new railroad embankment. During historical research, a drawing of construction of a portion of the New Orleans, Jackson, and Great Northern Railroad within the swamp was found (Figure 11). The drawing illustrates a borrow pit on either side of the embankment. This suggests that clay was pushed up over the trees that had been felled and aligned in the path of the future railroad. It is therefore likely that a depression in the clay, representing the antebellum borrow pit for the construction of the embankment, is present immediately adjacent to either side of the study area.

With the exception of one cypress plank, no other artifacts were found in the gray clay (Plate 10). The plank was found in Trench 5 near S2-1, approximately 150 cm (59.1 in) below datum. The function of the cypress plank is unknown, since it was not found attached to any other wooden features.

As was the case in Trenches 3 and 4, stumps and cypress knees were observed at the very lowest levels along with the horizontal logs or beams. One cypress knee (Plate 11) had obvious cut marks from an axe and had been burned. This suggests that slash and burn was utilized to clear the area for the railroad embankment.

Although no artifacts were found in the clay layers other than the wooden remains, an interesting array of artifacts was encountered in the top layer of very dark gray sandy loam in the very northern portion of Trench 5. Bottles dating to the early-to-mid-twentieth century were numerous in this thick stratum (see below). These include one colorless paneled pharmaceutical bottle dating between 1911 and 1929 and one amber round bottle dating between 1916 and 1929. More examples of mid-twentieth-century bottles were found, however, it is uncertain whether these artifacts represent refuse from the neighborhood or discards from passing trains or pedestrians. If this was a disposal area for the neighborhood, it was during the very earliest occupation of Hollygrove, since the majority of the artifacts do not date much before the mid-twentieth century. However, there most likely were temporary occupations along the railroad predating formal subdivision of the area.

Exploratory Sampling Areas 1 through 18. As noted above, 18 small exploratory trenches were excavated within the project area (Figure 42). These 18 trenches provided a better understanding of the remains in the Hollygrove railroad embankment, elucidated the nature of the thermal images, and helped document the size and density of the numerous pilings that were encountered throughout the project area. No hand excavation was employed at any of these 18 locations. Documentation was limited to informal sketches of the trenches, notes on the contents and stratigraphy of each trench, and photographs of each trench. Table 3 presents a summary of the results of these exploratory trenches.

Plate 9. Photograph of cypress and pine structural elements in Trenches 5 and 6.

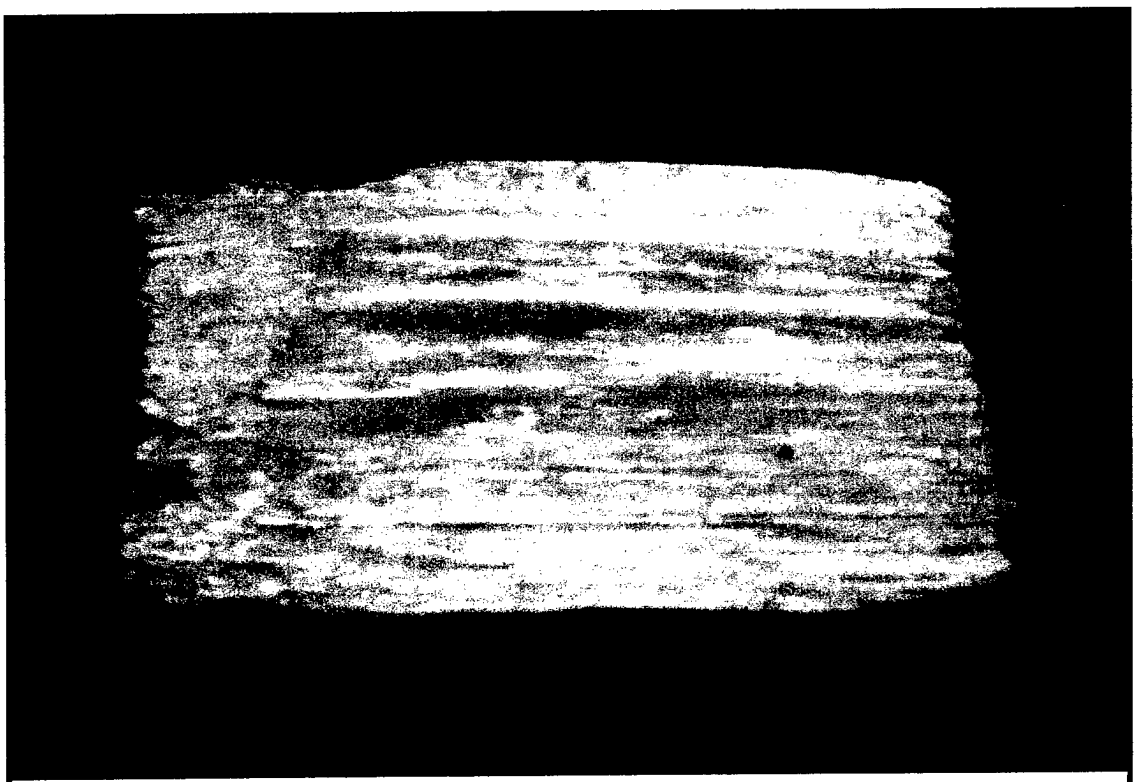


Plate 10. Photograph of plank recovered from Trench 5.

Plate 11. Photograph of a cypress knee from Trench 5 (not *in situ*).

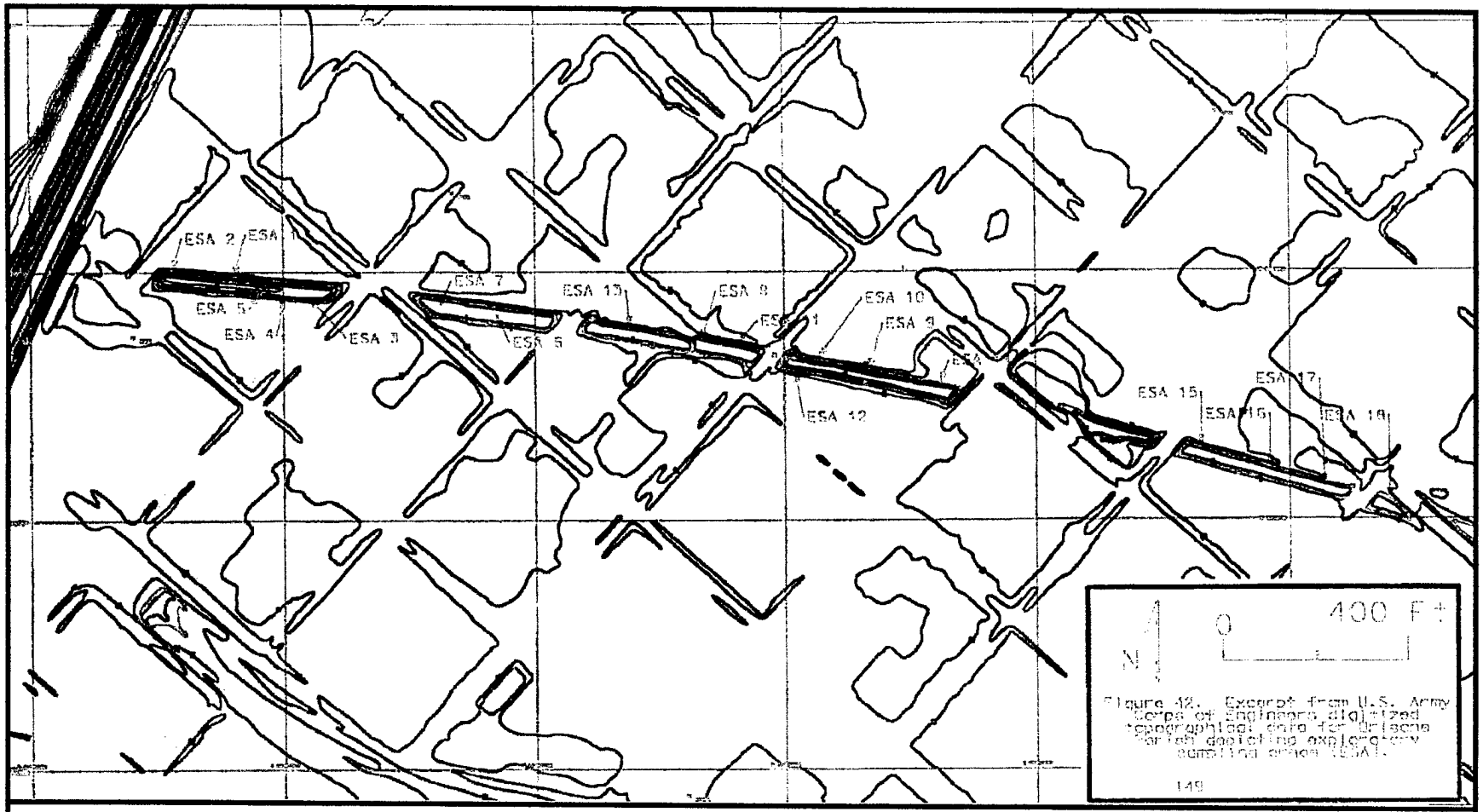


Figure 42. Map of project area depicting 18 exploratory trenches.

Table 3. Summary of Exploratory Sampling Trenches.

Exploratory Sampling Area (ESA)	Location	Depth (cm) of ESA	Depth of Pilings (tops)	Comments
1	Cherry/Live Oak	326	70	Bottom of pilings observed 326 cm below surface
2	Cherry/Live Oak	200	200	
3	Cherry/Live Oak	100	N/A	This ESA was excavated to measure the depth of the clay strata
4	Cherry/Live Oak	100	N/A	This ESA was excavated to measure the depth of the clay strata
5	Cherry/Live Oak	130	130	Water was observed in the wall
6	Mistletoe/Cherry	90	70-80	Thermal imaging "dead" zone—pilings not ex pected
7	Mistletoe/Cherry	75	63	Thermal imaging "dead" zone—pilings not ex pected
8	Hamilton/Mistletoe	130	100	Near Colapissa cul-de-sac
9	Hollygrove/Hamilton	250	110	Bottom of pilings observed 250 cm below surface
10	Hollygrove/Hamilton	120	95	Excavated across the embankment
11	Hamilton/Mistletoe	150	130	10 m long trench
12	Hollygrove/Hamilton	130	70	Diagonal trench
13	Hamilton/Mistletoe	65	60	Very small ESA
14	Hollygrove/Hamilton	175	N/A	No pilings; only horizontal fragments
15	Eagle/General Ogden	310	N/A	No pilings; only horizontal fragments
16	Eagle/General Ogden	175	N/A	No pilings; only horizontal fragments
17	Eagle/General Ogden	200	N/A	No pilings; only horizontal fragments and a lot of modern trash
18	Eagle/Forshey	180	50	Easternmost occurrence of pilings in project area

Exploratory Sampling Area 1, near the middle of the western embankment segment, was excavated to a depth of approximately 3.3 m (10.8 ft) to determine the length of one of the pilings. A piling was encountered at approximately 70 cm (27.6 cm) below the surface. It extended another 2.6 m (8.5 ft) into the embankment. It was approximately 17 cm (6.6 in) wide.

Thermal imaging indicated that differences in temperature occurred in staggered lines throughout most of the project area (Plates 12-14). This pattern was interpreted as the signature of the vertical pilings that were utilized to stabilize the embankment. Excavation of the exploratory trenches confirmed that pilings were present throughout the embankment, except in the portion between Hollygrove and Eagle streets. A small portion of the embankment west of Hollygrove Street was also observed to be devoid of pilings. This occurrence is almost equidistant on either side of the historic location of the Oleander Canal, suggesting some correlation between the pilings and their absence near this canal area. The remains within Trenches 3 and 4 indicate that, for some reason, pilings were not added at a later date to stabilize the embankment as they were throughout the remainder of the project area.

However, comparison of the results of thermal imaging and exploratory trenching suggests that stratigraphic differences may have had as great an effect on thermal imaging as the actual presence of buried wooden features. While thermal imaging indicated that pilings would be present in most portions of the project area, a few areas predicted to be devoid of pilings did in fact have them. Variations in the subsurface depth of clay, the concentration of gravel within individual strata, and the thickness of gravel-bearing strata would all necessarily affect temperature readings. In particular, the gravels present in strata throughout the embankment may have obscured the effects of the wood features. Plate 15 illustrates that where the embankment strata were thoroughly mixed within a backfilled trench, the linear nature of the subsurface pilings is obvious. Thus, while thermal imaging in all cases revealed the subsurface features of the embankment, they were not always the wooden features of primary interest in this study. It

Other Results of Thermal Imaging

Plates 16 and 17 illustrate a thermal image of the Upperline Canal levee on the trajectory of the embankment and a three-dimensional graph of the temperature readings, respectively. These illustrate stratification within the levee, as well as evidence that a portion of the embankment is preserved within the levee. A roughly convex area seen within Plate 17 appears to be the signature of the remains of the embankment.

In addition, thermal examination of the churchyard at the corner of Hollygrove and Oleander streets indicates that features associated with the embankment may be preserved in this area (Plate 18). The churchyard is the one portion of the embankment within the study area that has been leveled. No subsurface testing was undertaken in this area.

Evaluation of Standing Structures

The Hollygrove neighborhood was largely developed in the early- to mid-twentieth century (See Chapter 4). Residential in composition, the neighborhood's architectural specimen's range in style from shotgun bungalows of the early twentieth century to modern ranches. Many folk types of the mid-twentieth century are represented at Hollygrove including front, side gable and hipped roof examples. Minimal traditional and ranch houses complete the architectural landscape.

As part of the current project, a pump station has been proposed for the corner of Pritchard and Live Oak streets (Figure 43). Three existing buildings will have to be removed prior to construction of the pump station. Of the three buildings located within the proposed pump station area, only one is greater than fifty years in age. 2910 Live Oak Street (Louisiana Historic Resource Inventory No. 36-00336) was most likely constructed in the years immediately following World War II (see state of Louisiana Historic Resource Inventory form). The house is a one story, two-bay wide, three-bay deep, low-pitched hip roofed, folk dwelling. It has a wooden frame and a recessed porch on the left front. This is a very common type in Louisiana; it illustrates typical characteristics of mid-twentieth-century building techniques. Although very broadly associated with the theme of urban development in the city of New Orleans, 2910 Live Oak Street does not possess the qualities of significance and integrity, which have been defined by the National Register of Historic Places.

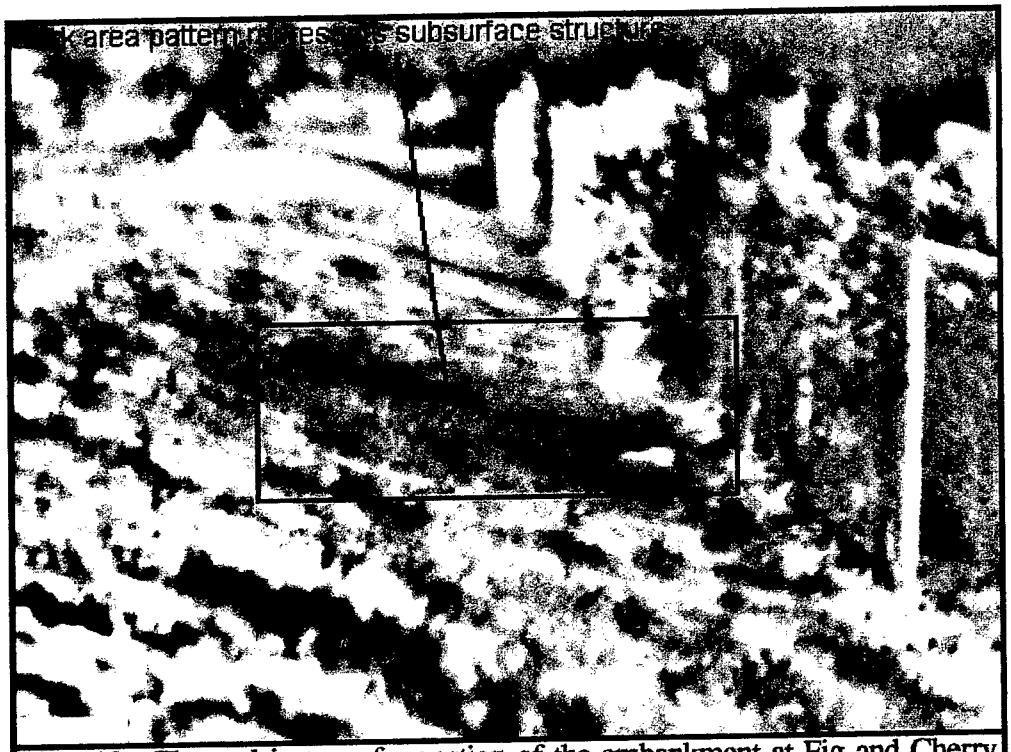


Plate 12. Thermal image of a portion of the embankment at Fig and Cherry streets (looking east) showing temperature variations occuring in staggered lines.

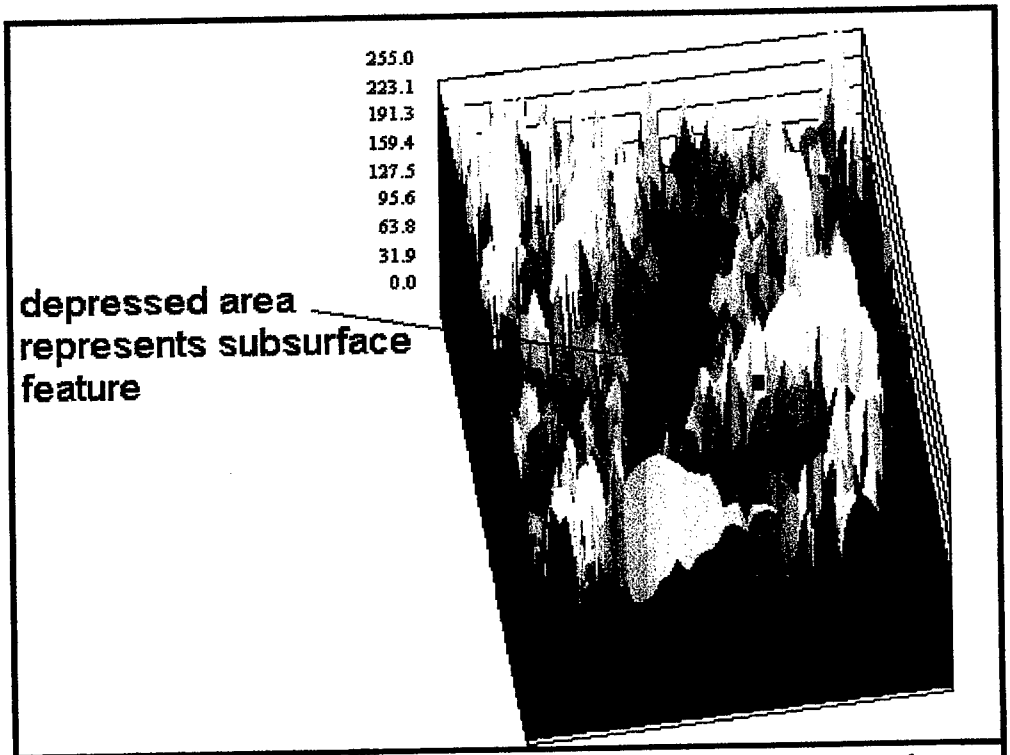


Plate 13. Three-dimensional graph of temperature variations seen in Plate 12.

Plate 14. Thermal image of a portion of the embankment at Oleander Street (looking east) showing temperature variations occuring in staggered lines.

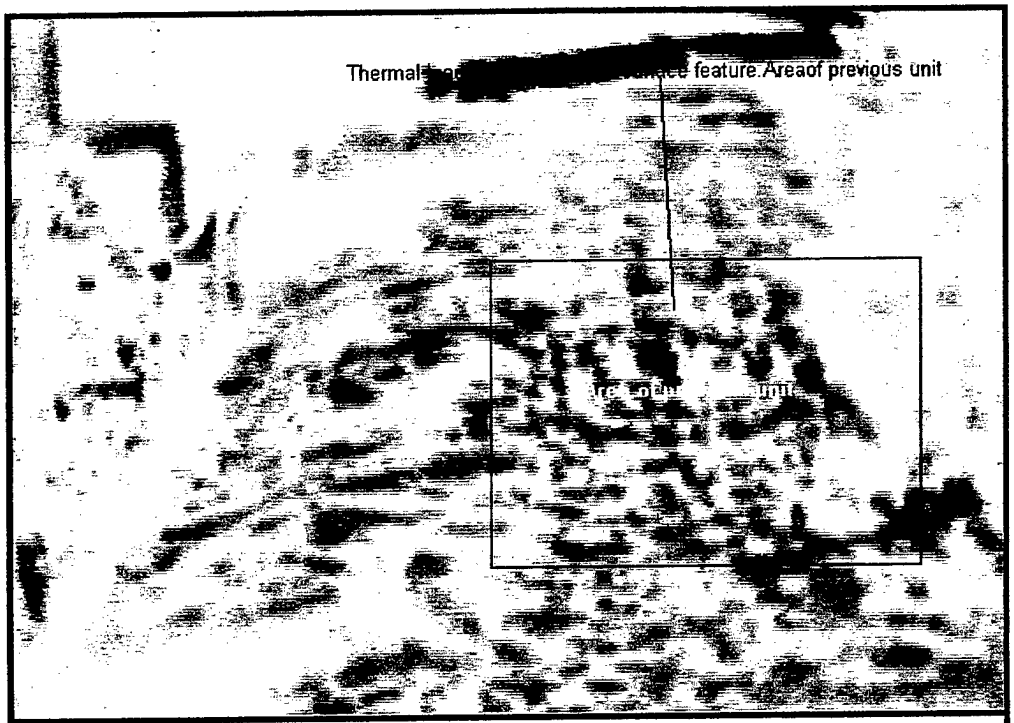


Plate 15. Thermal image of Trench 2 subsequent to backfilling showing signature of subsurface feature within area of disturbance.

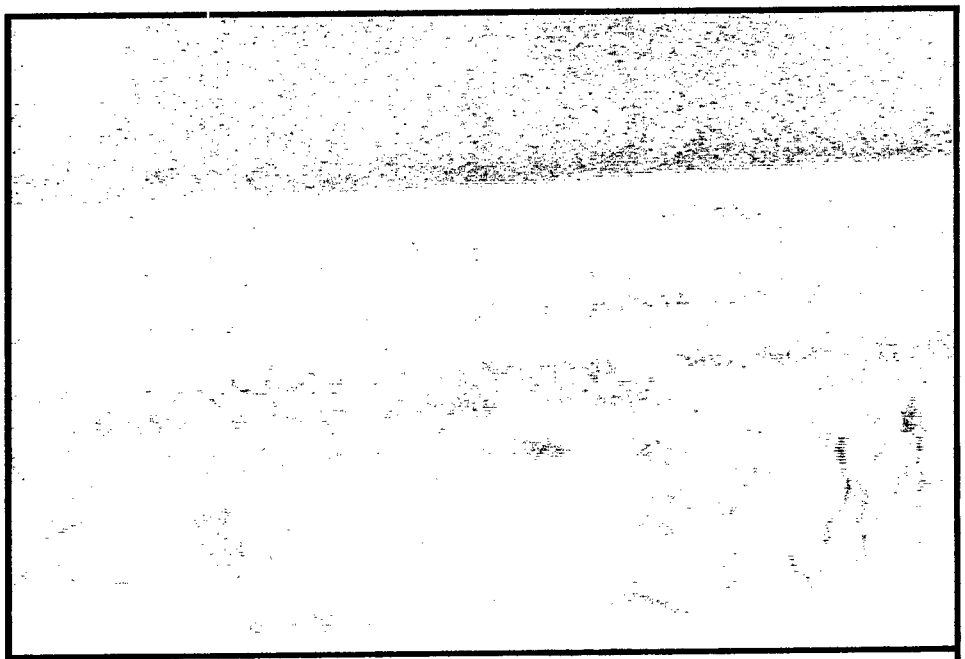


Plate 16. Thermal image of the Upperline Canal levee on a trajectory with the railroad embankment showing stratification within the levee.

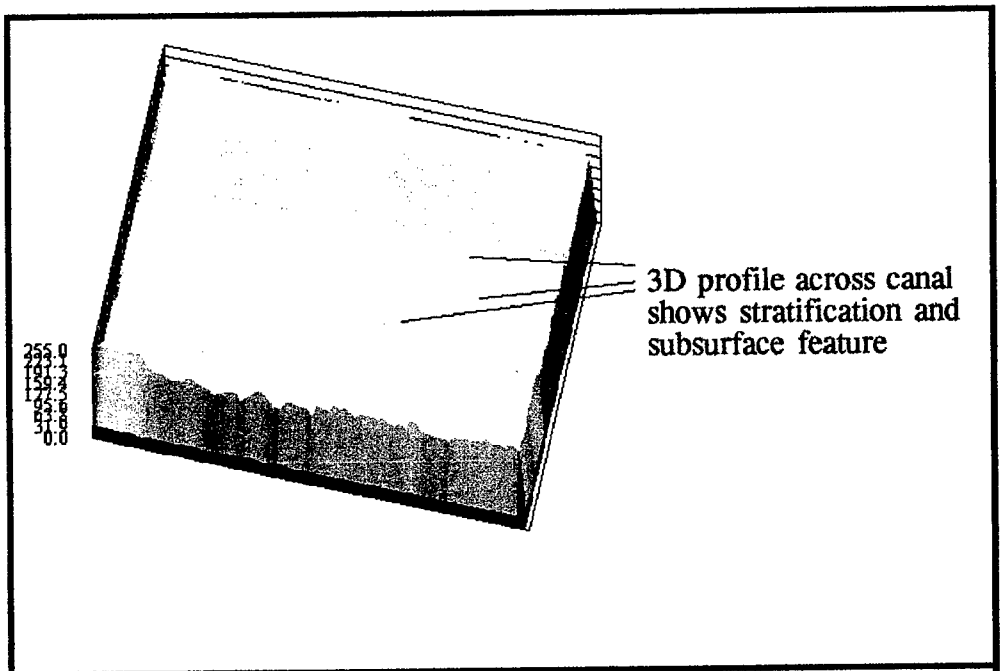


Plate 17. Three-dimensional graph of temperature variations seen in Plate 16 showing the signature of the embankment within the levee.

Plate 18. Thermal image of the churchyard at the corner of Hollygrove and Oleander streets showing subsurface features.

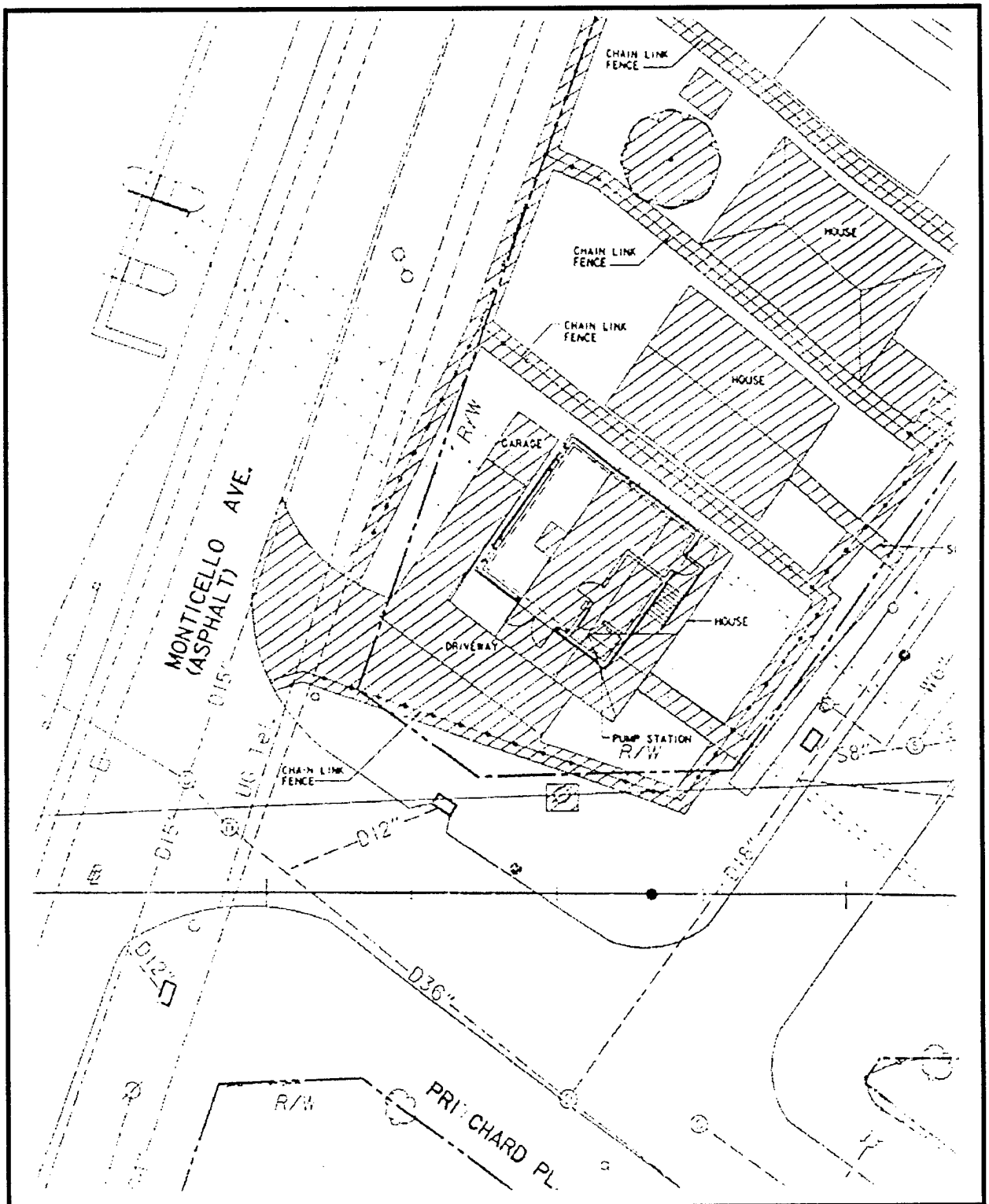


Figure 43. Plan view drawing of proposed pump station at Live Oak, Monticello, and Pritchard Streets, no scale.

CHAPTER 8
LABORATORY ANALYSES

Laboratory Methodology

Artifacts and cultural materials recovered from excavations in the railroad embankment are presented in Table 4. Materials recovered in the field were washed, sorted, and identified. Historic ceramics were classified utilizing the paradigmatic classification summarized in Yakubik (1990). Glass was described by color, manufacturing attributes (below), and function when identifiable; at minimum, sherds were sorted by color and counted. Other artifacts were described and dated as possible. Artifacts will be curated with the Division of Archaeology, Baton Rouge.

Ceramics

A total of 22 ceramic sherds representing a minimum of 11 vessels were collected (Table 4). These ranged in date from a sherd of late-nineteenth-century classic ironstone to mid-twentieth-century fiesta-type ware. The majority of the ceramics were tablewares, with a minimum of eight vessels including a large classic ironstone bowl, a gilded porcelaneous stoneware cup, two decaled ironstone plates, a gilded ironstone plate, a fiesta-type ware hollowware vessel, and two unidentified vessels. Utilitarian ceramics include a Bristol-glazed brownware jug, a brownware crock, and a green-glazed redware hollowware vessel.

Glass

A total of 76 glass artifacts were collected. A plurality of the glass is colorless (n=28; 36 percent). This includes complete and partial bottles as well as fragments. Green glass (n=14) is the second most common glass type collected and is followed by aquamarine glass (n=13), amber glass (n=9), milk glass (n=7), cobalt glass (n=3), yellow glass (n=1), and green Depression glass (n=1). The most common functional type recognized in the assemblage was pharmaceutical/medicinal bottles. Additional functional types include goblets, tumblers, milk bottles, jars, bulbs, insulators, liquor, soda, "cola," and bowls.

Sixteen complete or partial bottles were collected from five proveniences during field investigations (Plates 19-22). Five bottles were obtained from Trench 3, nine from Trench 5, and two from Trench 6. Six bottles were colorless, five were amber, two were aquamarine, one was cobalt, one was green, and the last was made from milk glass. Eleven of the sixteen bottles held some sort of pharmaceutical or medicinal preparation, one held perfume, one contained a beauty aid, and one held Coca Cola™. The functional attributes of one partial bottle could not be determined (Table 5).

One small, flat panel, screw top perfume bottle was collected from Trench 3. "Chanel" and "France" were located on the base of this bottle. No other diagnostic information was found on the bottle. Other bottles from Trench 3 include one colorless 4 dram pharmaceutical/medicinal bottle, one small aquamarine camphered panel pharmaceutical/medicinal bottle, one aquamarine Coca Cola™ bottle, and one small green camphered panel pharmaceutical/medicinal bottle. The aquamarine camphered panel bottle had Dr. Tichnor's on one side panel while the Coca Cola™ bottle was produced in McComb, Mississippi.

The Owens Illinois Glass Company manufactured three of the bottles collected from Trench 3. One bottle, with "Duraglas" on the lower body, was produced after 1940 but before 1966 (Toulouse 1969:403). The Dr. Tichnor's bottle was produced between 1951-1961 based on the factory and date number on the bottle's base (Toulouse 1969:395). The third bottle, a green camphered panel, was produced sometime between 1929 and 1966 (Toulouse 1969:403-406).

Table 4. Artifacts Recovered at Hollygrove.

Trench	1	1	1	1	1	1	2	2	3	3	3
Structure			1-1	1-2	2		2	S2-45			
Stratum	I	I		II	III		III	V	I		S1/2
Depth	0-30	Bckdrt	72-82	72-82	Bckdrt	Bckdrt	Bckdrt	Bckdrt	Bckdrt	Bckdrt	Bckdrt
Ceramics											
Classic ironstone										1	
Gilded ironstone										1	
Decaled ironstone										1	
Porcelaneous stoneware						1					
Gilded porcelaneous stoneware	1										
Porcelain				1							
Fiesta-type ware											
Bristol glazed brownware		1									
Bristol glazed brownware, albany slipped interior											
Green glazed											
Glass											
Amber beer											
Amber case bottle	1										
Amber pharm.									1		
Aquamarine "coke"									1		1
Aquamarine "soda"					1						
Aquamarine indet.	1										
Aquamarine pharm.											
Cobalt indet.											
Cobalt Noxzema											
Cobalt pharm.	1										
Colorless bulb						1					
Colorless fuse											
Colorless goblet										1	
Colorless handle	1										
Colorless indet.			2							1	
Colorless Insulator										1	
Colorless milk bottle											
Colorless molded jar										1	
Colorless molded lid	1										
Colorless perfume										1	
Colorless pharm.			1						1	1	
Colorless soda		1									
Colorless tumbler											
Colorless-burned											

Table 4, Continued.

Trench	1	1	1	1	1	1	2	2	3	3	3
Structure			1-1	1-2	2		2	S2-45			
Stratum	I	I		II	III		III	V	I		S1/2
Depth	0-30	Bckdrt	72-82	72-82	Bckdrt	Bckdrt	Bckdrt	Bckdrt	Bckdrt	Bckdrt	Bckdrt
Green "soda"					1						
Green Depression											
Green indet.	1										
Green insulator											
Green liquor											
Green pharm.									1		
Milk glass bowl											
Milk glass indet.	1		1								
Milk glass ointment											
Milk glass Vacher-Balm		1									
Yellow indet.											
Metal											
Bolt											
Can										1	
Flashlight battery	1										
Flat clip											
Fuse											
Lock fragment	1										
Machine cut nail											
Metal Railroad Plate							1				
Railroad spike							4				
Square trowel					1						
U-bolt											
Other											
Asbestos siding											
Asphalt											
Plastic pipe									1		
Plastic screw cap			1						1		
Pumice			1								
Rock											
Slag			1								
Wood								8			
Total	**9**	**2**	**7**		**3**	**1**	**5**	**8**	**6**	**7**	**1**

Table 4, Continued.

Trench	4	4	4	5	5	5	6	6	
Structure	1				1	S2-1		1-13	
Stratum		II/III		I	V	VI	I	IX	
Depth	Bckdrt	165	Bckdrt	Bckdrt	125	150	Bckdrt	Bckdrt	Total
Ceramics									
Classic ironstone									1
Gilded ironstone									1
Decaled ironstone							1		2
Porcelaneous stoneware									1
Gilded porcelaneous stoneware									1
Porcelain									1
Fiesta-type ware							6		6
Bristol glazed brownware							1		2
Bristol glazed brownware, albany slipped interior				4			2		6
Green glazed				1					1
Glass									
Amber beer							1		1
Amber case bottle									1
Amber pharm.				5			1		7
Aquamarine "coke"				3					5
Aquamarine "soda"									1
Aquamarine indet.		1							2
Aquamarine pharm.				5					5
Cobalt indet.							1		1
Cobalt Noxzema				1					1
Cobalt pharm.									1
Colorless bulb									1
Colorless fuse							1		1
Colorless goblet									1
Colorless handle							1		2
Colorless indet.									3
Colorless Insulator									1
Colorless milk bottle				1					1
Colorless molded jar									1
Colorless molded lid									1
Colorless perfume									1
Colorless pharm.				7					10
Colorless soda							2		3
Colorless tumbler				1					1
Colorless-burned	1								1

Table 4, Continued.

Trench	4	4	4	5	5	5	6	6	
Structure	1				1	S2-1		1-13	
Stratum		II/III		I	V	VI	I	IX	
Depth	Bckdrt	165	Bckdrt	Bckdrt	125	150	Bckdrt	Bckdrt	Total
Green "soda"							4		5
Green Depression							1		1
Green indet.									1
Green insulator				2			2		4
Green liquor				2					2
Green pharm.				1					2
Milk glass bowl							3		3
Milk glass indet.									2
Milk glass ointment							1		1
Milk glass Vacher-Balm									1
Yellow indet.					1				1
Metal									
Bolt							1		1
Can									1
Flashlight battery									1
Flat clip							1		1
Fuse							1		1
Lock fragment									1
Machine cut nail			1						1
Metal Railroad Plate							1		2
Railroad spike				1				1	6
Square trowel									1
U-bolt				1					1
Other									
Asbestos siding				3					3
Asphalt							1		1
Plastic pipe									1
Plastic screw cap									2
Pumice							1		2
Rock							1		1
Slag									1
Wood						1			9
Total	1	1	1	33	1	1	25	1	113

Four colorless pharmaceutical/medicinal bottles were obtained from Trench 5. Two of the colorless bottles were 2 dram ball neck panel bottles and two were 3 ounce ball neck panel bottles (Putnam 1965:23-28) (Plate 19). Four amber bottles were also collected from Trench 5. Two were round pharmaceutical/medicinal bottles (Plate 20); one was a small, "Paris Square" pharmaceutical/medicinal bottle (Putnam 1965:29, 101) (Plate 21). The functional attribute of the fourth amber bottle could not be determined. Finally, one cobalt, short ointment bottle was collected from Trench 5. Noxzema was located on the base of this bottle (Putnam 1965) (Plate 22).

A colorless bottle obtained from Trench 5 was manufactured by the Owens Bottle Company between 1911-1929, while an amber bottle, also from Trench 5, was manufactured by the Illinois Glass Company between 1916-1929 (Toulouse 1971:264-268, 393-397). Four more bottles from Trench 5 were produced after the Owens and Illinois Glass companies combined in 1929. "Duraglas" was located on the lower body of three of the four bottles, indicating they were produced after 1940 (Toulouse 1969:395). The factory number of the fourth bottle indicates it was produced at the Clarksburg, West Virginia, plant in 1938. The final bottle yielding temporal data that was collected from Trench 5 was manufactured by the Armstrong Glass Company between 1938 and 1969 (Toulouse 1969:24-25).

One amber, short round pharmaceutical/medicinal bottle was obtained from Trench 6, Stratum I. No diagnostic information was found on this bottle. One milk glass, short ointment bottle was recovered from the Trench 6, Stratum I backdirt (Putnam 1965:91-92). This bottle had Vacher-Balm located on its base.

Temporal data derived from this limited sample suggests two distinct periods of bottle manufacture. The earlier cluster consists of those bottles manufactured by the Owens Glass Company and the Illinois Glass Company between 1911 and 1929, with a median production date of 1920. The later cluster is comprised of bottles manufactured after these two companies merged, with the addition of the bottle produced by the Armstrong Glass Company. The later cluster dates between 1938 and the ca. 1966, with a median production date of 1951. Interestingly, most of the Owens-Illinois bottles were produced in West Virginia.

Metal

Seventeen metal artifacts were recovered from the Hollygrove project area. Most of these artifacts are not temporally diagnostic. One exception is the machine cut square nail collected from Trench 4. The morphological attributes observed on this nail correspond to those produced between 1820 and 1891 (Wells 1998:Type 8). A crushed can, a lock fragment, a U-bolt, a bolt, and a fuse are somewhat problematic, since they could indicate either a domestic or industrial context. The flashlight battery is recent.

The two examples of rail tie plates recovered are a general type in use on American railroads after 1906 (Tratman 1926:61). Tie plates were first used at rail joints only; then at joints, half-rail points, and on curves; and finally, on every tie. The two examples from the Hollygrove embankment differ in several respects. They are rectangular but of different sizes, the smaller one measuring 8.75" by 7.5" (from Trench 2) and the larger measuring 10" by 7.5" (from Trench 6). Both were aligned with the rail running across the shorter dimension, that is, with the rail running perpendicular to the long side of the plate. The larger of the two plates recovered from the Hollygrove embankment has a diagonal crisscross pattern of lugs on its underside, but the smaller lacks lugs or ribs. Various patterns of lugs and ribs were tried to assist adhesion of plates to wooden ties, but their positive effect was reduced by the increased water damage to the ties caused by the lugs. The smaller of the Hollygrove tie plates has six holes in it (4 square holes and two round holes), and the larger has only four square holes.

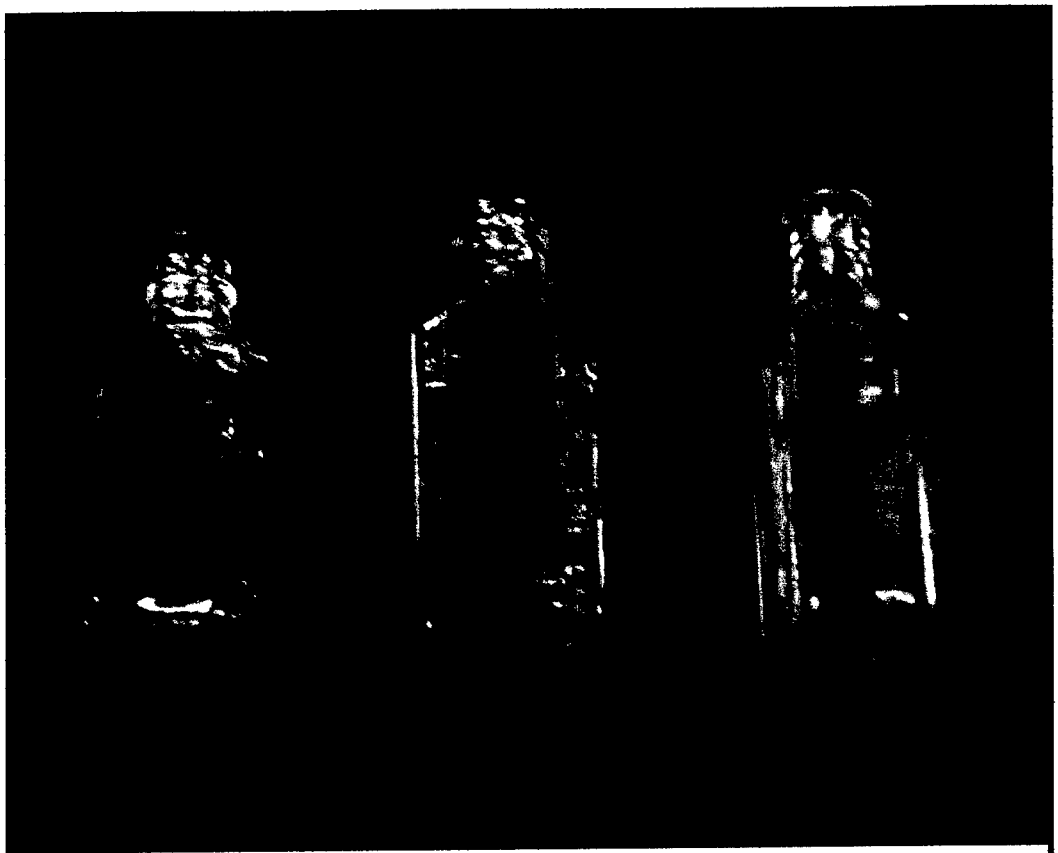


Plate 19. Clear pharmaceutical bottles, all manufactured after 1940.

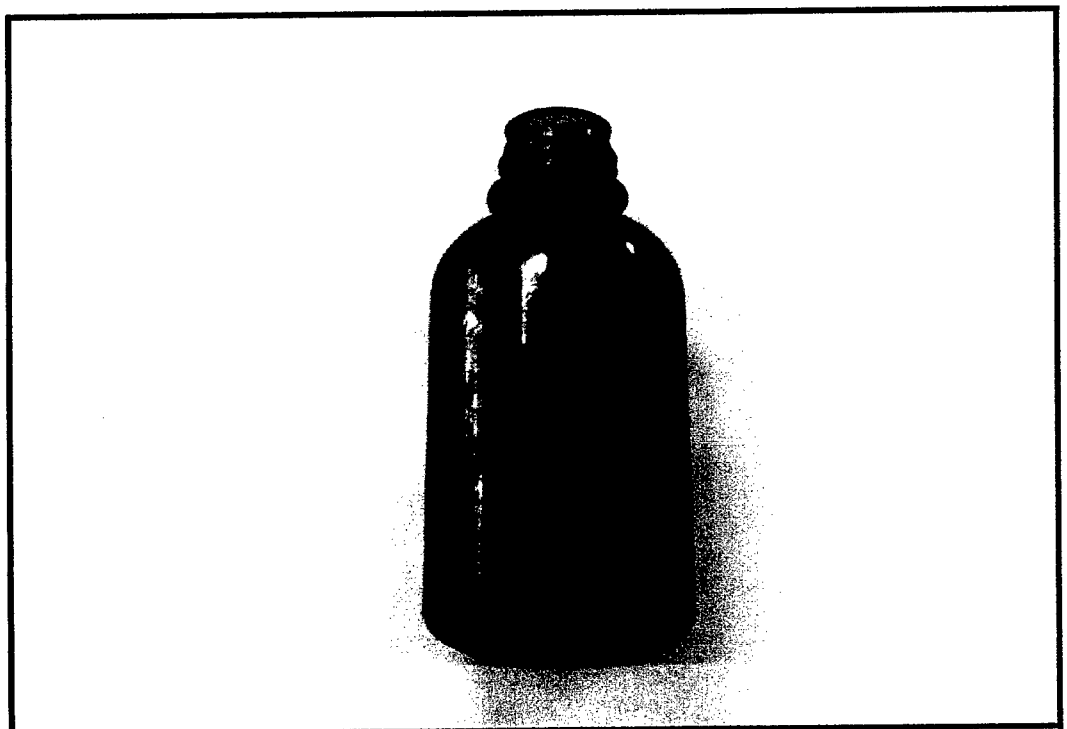


Plate 20. Brown pharmaceutical bottle manufactured by Armstrong from 1938 to present.

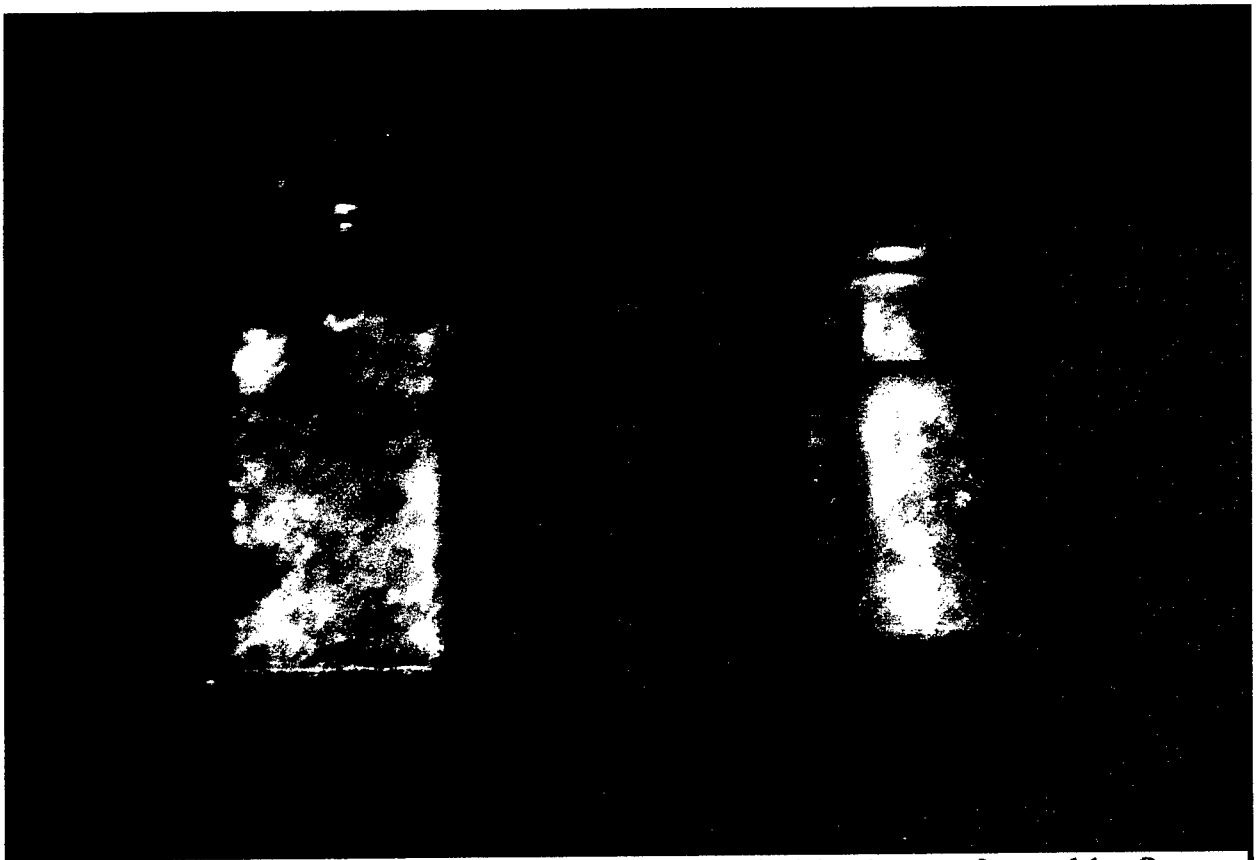


Plate 21. Brown bottles. On the left is a pharmaceutical bottle manufactured by Owens-Illinois 1938, on the right is an ink bottle of unknown manufacture.

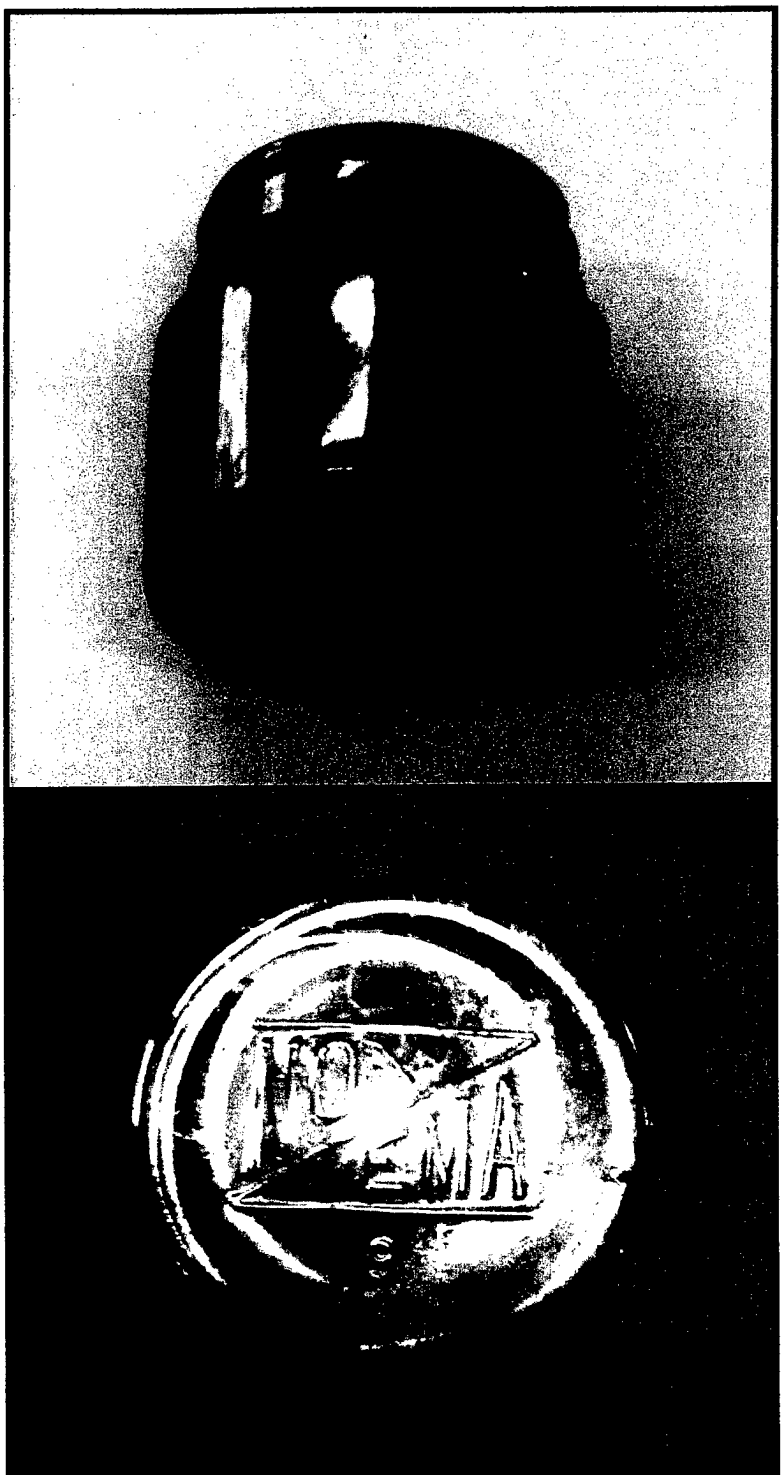


Plate 22. Short blue ointment bottle with NOXEMA on base.

Table 5. Bottles Recovered from Hollygrove.

Provenience	Color	Bottle Maker	Bottle Type	Manufacturer	Date Range	Description
Trench 3, Str. 1	colorless	automatic	4 dram ball neck panel	Owens-Illinois Glass Co.	1940-Present	DURAGLAS on body
Trench 3, Str. 1	aquamarine	automatic	small camphered panel	Owens-Illinois Glass Co.	1951-1961	Dr. TICHNOR'S on side panel
Trench 3, Str. 1	aquamarine	automatic	Coca Cola bottle	unknown	N/A	MC COMB MISSISSIPPI on base
Trench 3, Str. 1	green	automatic	small camphered panel	Owens-Illinois Glass Co.	1929-Present	metal screw cap with glass dropper
Trench 3, Backdirt	colorless	automatic	small, flat panel, perfume	unknown	N/A	CHANEL FRANCE on base
Trench 5, Backdirt	colorless	automatic	2 dram ball neck panel	Owen Glass Company	1911-1929	N/A
Trench 5, Backdirt	colorless	automatic	3 ounce ball neck panel	Owens-Illinois Glass Co.	1940-Present	DURAGLAS on body
Trench 5, Backdirt	colorless	automatic	2 dram ball neck panel	Owens-Illinois Glass Co.	1940-Present	DURAGLAS on body
Trench 5, Backdirt	colorless	automatic	3 ounce ball neck panel	Owens-Illinois Glass Co.	1940-Present	DURAGLAS on body
Trench 5, Backdirt	amber	automatic	round prescription	Armstrong	1938-Present	N/A
Trench 5, Backdirt	amber	automatic	"Paris Square" prescription	Owens-Illinois Glass Co.	1938	N/A
Trench 5, Backdirt	amber	automatic	round prescription	Illinois Glass Co.	1916-1929	N/A
Trench 5, Backdirt	amber	automatic	unknown	unknown	N/A	N/A
Trench 5, Backdirt	cobalt	automatic	short ointment	unknown	N/A	NOXZEMA on base
Trench 6, Str. I	amber	automatic	short round	unknown	N/A	
Trench 6, Str. I, backdirt	milk glass	automatic	short ointment	unknown	N/A	VACHER-BALM on base

Observation of I.C.R.R. track remaining on the western side of the Upperline Canal, in the old Southport railroad district, Jefferson, Louisiana, indicates that the plate recovered from Trench 2 is a Sellers Patent of 1908 track plate (Figure 44). In fact, the word "Sellers" is barely visible on the oxidized plate. Two, three, or four spikes could be driven through the square holes to attach the rail to the plate and the plate to the tie. On the Sellers plate, the round holes are for screw spikes, which attached the plate to the tie but served no purpose in holding the rail on the plate. Screwing plates down to ties was favored when the wood of the ties was soft; this process may have been the basis for the Sellers patent of 1908. None of the examples of screw-down type plates observed at Southport were actually screwed down. This may mean that the wood utilized for these ties was hard enough forego the screws. A softer, local wood may have been used for ties in the early part of the twentieth century, thus necessitating the Sellers screw down plate. Ties would have been changed frequently, but plates could be used for decades, as demonstrated by the presence of the Sellers 1908 type plate in tracks that are still periodically used.

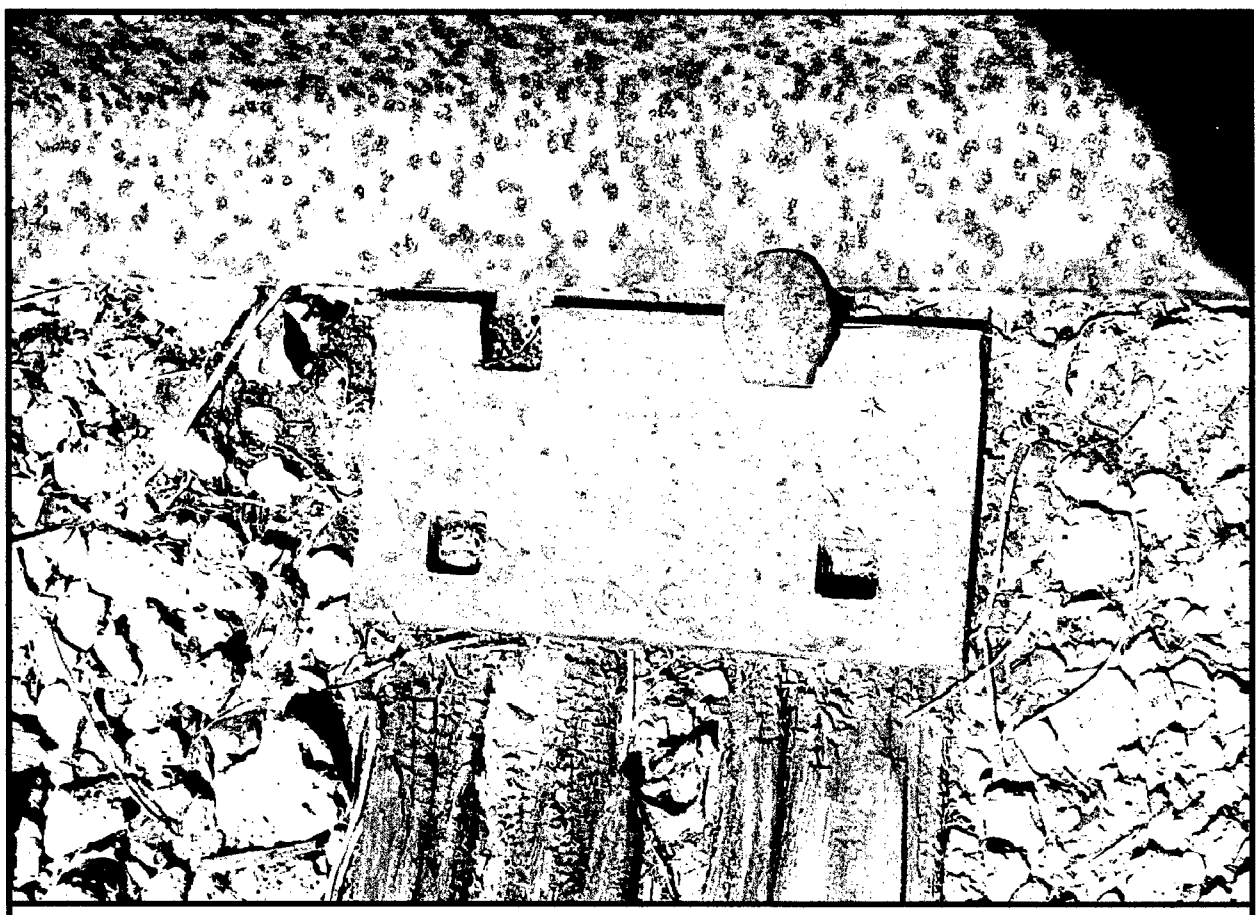


Figure 44. Photograph depticting standard *in situ* 8 tie plate.

Both plate examples recovered archeologically have a prominent shoulder on the side of the top, towards the outside of the rail. There is also a much smaller shoulder on the inside, creating a seat 5" wide between the spike holes. Thus, both tie plates are for "T" rails with 5" bases. Five-inch bases were used on a limited number of post-1907 rail types, including 80-pound per yard A.S.C.E.-section rails, 90-pound per yard Dudley-section rails, and 100-pound per yard Pennsylvania Railroad-section rails (Crandall and Barnes 1913:251-264; Tratman 1926:35-43, 50-54; Raymond et al. 1947:108-117, 139). Rails on an I.C.R.R. siding at the Graham Packaging Co. in Southport, approximately 150 yards from the Upperline Canal, have a base measurement of 5" and are 5¾" high, which is close to Pennsylvania R.R. 100-pound rail

standards. They are probably of the same pattern as rails used in the Hollygrove embankment prior to replacement with heavier rails. Rail weights continued to increase significantly in the twentieth century, and before 1950, Illinois Central mainline track had 132-pound rails. These had bases 5" in width, were 6½" in height (Corliss 1950:449), and were 45' long, as observed at the I.C.R.R. track in Southport.

The two tie plates recovered from the Hollygrove embankment may have been intended for placement on ties of different widths, since it was usual practice for the plates to span the entire width of the tie. It is possible that the Hollygrove tie plates, at least the Sellers 1908 Patents, were placed relatively soon after their initial manufacture, and perhaps both examples of tie plates were used with rails weighing 100 pounds per yard. They may or may not have been used simultaneously. Since the tie plates are for ties of different widths, they could represent artifacts of one or more tie-changing episodes in between the introduction of tie plates and the replacement of lighter rails under the heavy traffic conditions of the Illinois Central line. The lifespan of railroad ties varied as a result of a number of factors, including type of wood, treatment with preservatives, climate, mechanical wear, etc. Untreated oak ties could be expected to last from 3 to 10 years, cedar 6 to 12 years, cypress 5 to 12 years, and southern yellow pine from 6 to 10 years. Creosoting increased the lifespan of ties by at least 50 percent, but in 1925, about 50 percent of the ties laid in the United States in the preceding five years were untreated. Railroad ties also varied in size over time. Before 1910, they were usually 6" thick, 8" wide, and 8' long, but became larger after that date as loads became greater. By the end of the first quarter of the twentieth century, main track ties were usually 7" by 9" by 8½', a size frequently used today. By A.R.E.A. standards, a tie sawn on four sides 9" in width was a class 5-A tie, and one sawn on two sides (top and bottom) 9" in width was a class 5-B tie. A tie sawn on four sides 10" in width was a class 6-A tie; a tie 10" in width sawn on two sides was a class 6-B tie. Class 6-A and 6-B ties (10" in width) were not commonly used, and were evidently more often of pine than of hardwood. In practice, however, individual ties were replaced as they were needed rather than large portions of sections being changed all at once. Thus, the differing width of the recovered tie plates does not necessarily imply that they were in place on the line at different times, despite it being likely that they would have been on ties of different widths. Uniformity of tie width within a track section was not very important to the efficiency with which ballast could be maintained. Since tie plates were longer-lived, they were reused (as long as they fit the rails) until they were damaged or rusted sufficiently to be replaced (Crandall and Barnes 1913:251-264; Tratman 1926:35-43, 50-56; Raymond et al. 1947:108-117, 139).

As observed at the I.C.R.R. tracks in Southport, several varieties of tie plates could be found within any short track section, while ties were usually also present from several replacement episodes. In fact, on the Graham Packaging Co. spur, a Sellers 1908 Patent tie plate was observed on a slightly weathered tie stamped "IC 6 95," indicating that it was replaced by the Illinois Central in June 1995. Most tie plates spanned the full width of the ties, but some did not, further indicating replacement of ties but re-use of tie plates. Thus, it is possible that ties that were the dimensions of those first fitted with tie plates on the I.C.R.R. (represented by the Sellers 1908 Patent tie plate) were replaced by another set of slightly larger ties and plates (e.g., the second recovered example, Trench 6) still utilizing 5"-base rails, as on the Graham Packaging Co. spur track. Eventually, the 5"-base rails were replaced by heavier rails with wider bases, necessitating the replacement of all the old 5"-base rail tie-plates. In Jefferson, two rail sections used as bollards were observed at a road crossing the old I.C.R.R. main line; these heavily-worn rails had bases 5½" in width and were about 6¾" high, close to Pennsylvania R.R. 130-pound rail standards. They may be examples of the rails that replaced the 5"-base width rails (used in the Sellers 1908 tie plates) on the I.C.R.R. main line. Tie plates designed for Illinois Central-standard 132-pound per yard rails were in use when the I.C.R.R. line went out of service through Hollygrove (such as the Sellers 1928 pattern plate and several other patterns observed in Southport). Most of these tie plates had eight holes for spikes and were 8" wide and 13" in length, fitted on ties of the same width (Figure 45). By way of contrast, the Amtrak tracks

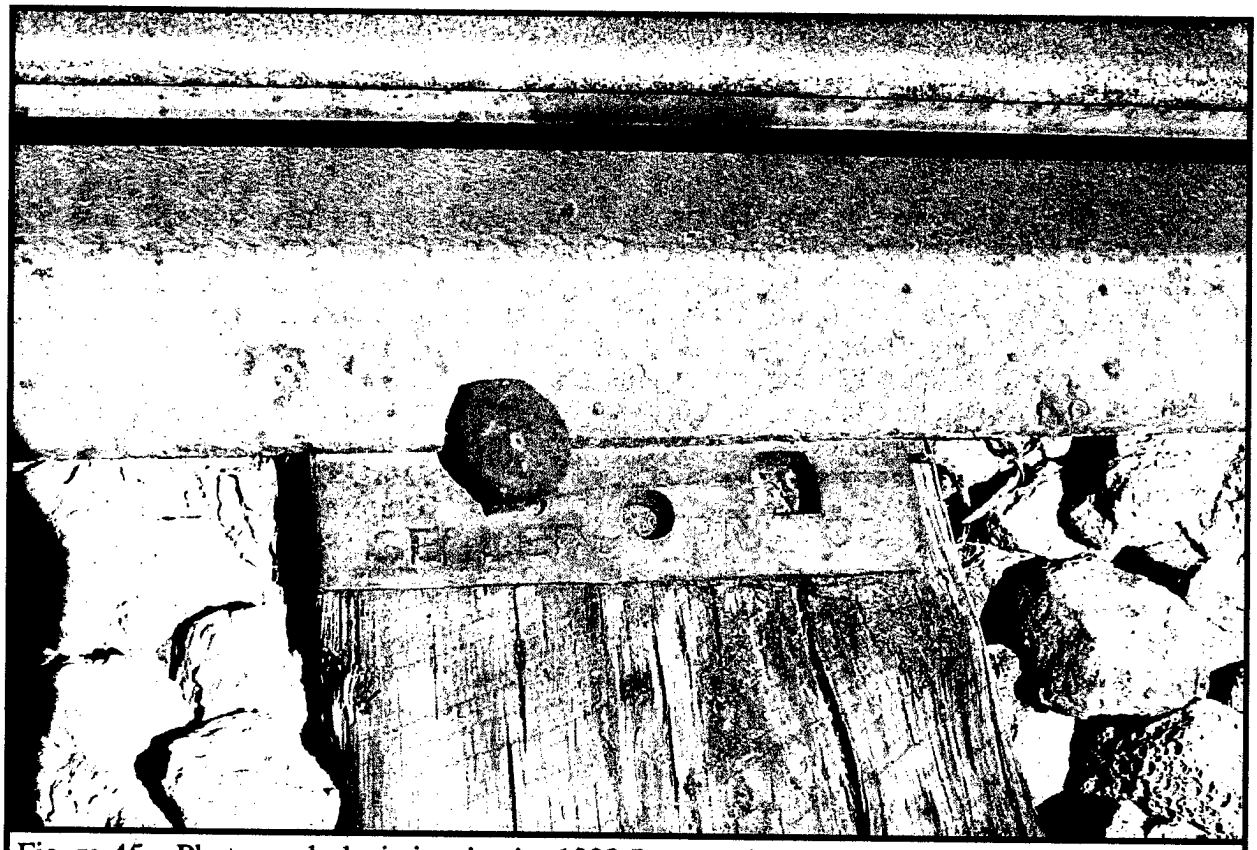


Figure 45. Photograph depicting *in situ* 1908 Patent rail plate.

that intersect the old I.C.R.R. alignment about 200 yards west of the Upperline levee have Pennsylvania R.R. system-standard 130-pound tracks on smaller tie-plates measuring 7¾" by 11", attached to ties 9" in width.

Miscellaneous Artifacts

Miscellaneous artifacts include wood chip fragments, one wooden plank fragment, pumice fragments, asbestos siding, plastic bottle screw caps, a rock, a piece of asphalt, a piece of slag, and a piece of plastic pipe. The wooden plank fragments were directly associated with the railroad itself. The pumice, rock, and slag are more than likely associated with construction of the railroad embankment. The plastic bottle screw caps and pipe are artifacts incorporated into the railroad embankment but undoubtedly represent local trash disposal. Disturbed stratigraphy and temporal mixing was most likely the result of years of fitting and retrofitting of the railroad.

CHAPTER 9
RECOMMENDATIONS

NRHP test excavations of the historic railroad embankment in the Hollygrove neighborhood of New Orleans revealed details of its construction and maintenance. Although it was expected that the remains of cribwork for support of the railroad crossties would be preserved within the embankment, it appears that cribbing was never in fact utilized along that portion of the embankment within the project area. Instead, it appears that logs from trees felled during clearing the swamp for the railway were utilized to form the base of the embankment. Features associated with this initial construction were found within the horizon of the backswamp that originally occupied the Hollygrove neighborhood in Trenches 1 through 6, and they appeared to be best preserved in Trenches 3 and 4. Subsequently, vertical pilings were utilized to stabilize the embankment along the majority of its course; only those portions adjacent to the former Oleander Canal were devoid of pilings. Excavation of six trenches and 18 exploratory areas, in conjunction with extensive archival research, has thus yielded considerable data on the engineering, construction and maintenance of the railroad embankment. It is the contractor's opinion that NRHP test excavations have exhausted the research potential of the embankment, and that further excavations are unlikely to yield additional information. Consequently, site 16OR152 is ineligible for nomination to the National Register of Historic Places. No additional archeological investigations are recommended. Furthermore, because of the nature of the planned construction, archeological monitoring is unlikely to be of any utility. No further work is recommended.

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APPENDIX 1

CELMN-PM-RN

July 21, 1999

Modification 01
REVISED
SCOPE OF SERVICES

National Register Testing of a railroad embankment for the Hollygrove Drainage Improvements feature of the Southeast Louisiana Urban Flood Control Project, Orleans Parish, Louisiana

1. Introduction. This task order requires National Register testing at an embankment. The National Register archaeological testing to be performed under this delivery order is in support of construction of the Hollygrove Drainage improvements feature of the Southeast Louisiana Urban Flood Control Project. The purpose of the work is to provide a determination of eligibility of a railroad embankment in the project area for the National Register of Historic Places and to determine the extent of the impact that would occur as a result of canal construction.

2. Study Area. Earth Search, Inc., conducted background research on the project area for a landuse history for planned canal improvements in Orleans and Jefferson Parishes. This research identified a potentially historic railroad embankment. The purpose of this task order is to determine if the embankment and its contents are eligible for the National Register of Historic Places. The site testing will be conducted within the limits indicated on the map.

3. General Nature of the Work. The work consists of archeological testing of the right-of-way for this project as indicated on the enclosed maps. The archeological testing shall be sufficient to make determinations regarding impacts to cultural resources along the construction route and to determine if the property is eligible for the National Register of Historic Places. The study will include additional historical research on the project area in order to develop the research potential of the area. The archaeological testing will be sufficient to determine the significance of the property as well as any possible impacts to intact cultural resources within the project impact area. All material will be analyzed and a final report prepared.

4. **Study Requirements**. The study will be conducted utilizing current professional standards and guidelines including, but not limited to:

• the National Park Service's National Register Bulletin 15 entitled, "How to Apply the National Register Criteria for Evaluation;"

o the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation as published in the Federal Register on September 29, 1983;

• Louisiana's Comprehensive Archeological Plan dated October 1, 1983;

• The Advisory Council on Historic Preservation's regulation 36 CFR Part8OO entitled, "Protection of Historic Properties."

The study will be conducted in three phases: Historical Research, National Register testing oi'the project area, and data analysis and report preparation.

A. Phase 1: Historical Research. The study will begin with background research. Historical research will include title searches and review of other written, cartographic and aerial photography records sufficient to reconstruct the historic land uses of the property.

B. Phase 2: National Register Testing. The site testing will commence with the establishment of a grid over the site area. Testing will concentrate on **three** separate, non-contiguous areas of the embankment approximately 15-30 meters in length each. Areas to be selected in consultation with the COR to test representative areas of the embankment. **Remote sensing shall be conducted of ~~additional high probability~~ all areas of the embankment which are accessible.** The contractor shall use backhoe trenches as the primary method of testing followed by documentation of any features or artifacts by photography, drawings, and written descriptions. **The contractor shall excavate additional backhoo trenches to determine the nature of the buried features**. Both parallel and perpendicular trenches should be used as appropriate. Excavations should be at sufficient depth to identify lower limits of cultural deposits and sterile sub soil.The contractor The testing will determine the site boundaries, depth of deposit, stratigraphy, cultural association, and possible activity areas.

All profiles and features excavated shall be mapped and photographed. Detailed site maps illustrating the horizontal

extent of the site, the stratigraphy, the locations of all subsurface tests, the delineation of disturbed portions of the site, feature locations, and artifact densities shall be prepared. All backhoe trenches will be immediately backfilled upon completion of archeological recordation.

After the completion of fieldwork, the contractor shall prepare a brief management summary for use in coordination with the State Historic Preservation Office. The management summary must most all requirements of the Louisiana State Archeologist for a management summary. The contractor will include a summary of the field and archival research completed to that time in the management summary. In addition, the contractor shall provide recommendations for future testing or data recovery for the railroad embankment.

C. Phase: Data Analyses and Report Preparation. All data will be analyzed using currently acceptable scientific methodology. The Contractor shall catalog all artifacts, samples, specimens, photographs, drawings, etc.,...utilizing the format currently employed by the Louisiana State Archeologist. The catalog system will include site and provenience designations.

All cultural resources located by the survey will be evaluated against the National Register criteria contained in Title 36 CFR Part 60.4 to assess the eligibility for inclusion in the National Register. The Contractor shall classify the embankment as either eligible for inclusion in the National Register or not eligible. The Contractor shall fully support his recommendations regarding site significance. If the Contractor recommends further work in the project area, a plan for additional work shall be developed. Data recovery and monitoring during construction should be evaluated as possible mitigation strategies.

The analyses will be fully documented. Methodologies and assumptions employed will be explained and justified. Inferential statements and conclusions will be supported by statistics where possible.

6. Reports:
Draft and Final Reports. Six copies of the draft report integrating all phases of this investigation will be submitted to the COR for review and comment within 6 weeks after delivery order award. Along with the draft reports, the Contractor shall submit:

Three copies of the National Register Registration Forms for each site recommended as eligible for inclusion in the National Register. This documentation will contain all of the data

required by NPS National Register Bulletin 16: Guidelines for Completing National Register of Historic Places Forms.

The written report shall follow the format set forth in MIL- STD-847A with the following exceptions: (1) separate, soft, durable, wrap-around covers will be used instead of self covers; (2) page size shall be 8-1/2 x 11 inches with 1-inch margins; (3) the reference format of American Antiquity will be used. Spelling shall be in accordance with the U.S. Goverment Printing Office Style Manual dated January 1973.

The COR will provide all review comments to the Contractor within 8 weeks after receipt of the draft reports (14 weeks after work item award). Upon receipt of the review comments on the draft report, the Contractor shall incorporate or resolve all comments and submit one preliminary copy of the final report to the COR within 4 weeks (18 weeks after work item award). Upon approval of the preliminary final report by the COR (within I week after submittal), the Contractor will submit 40 copies and one reproducible master copy of the final report to the COR within 19 weeks after work item award. The Contractor will also provide computer disk(s) of the text of the final report in Microsoft Word or Pagemaker format.

7. Right-of-entry. The New Orleans District will obtain right- of-entry for archeological investigations in the study area.

APPENDIX 2

Louisiana Historic Resource Inventory

Louisiana Division of Historic Preservation
Office of Cultural Development
Department of Culture, Recreation, and Tourism

Resource ID Number: ☐☐-☐☐☐☐☐-☐
parish # resource #

☐ Addendum Attached

Locational and Geographic Information

Name of Property: _____

Address: 2910 Live Oak **Parish:** Orleans

Locality: ☒ City ☐ Community ☐ Vicinity ☐ Rural

City/Community/Vicinity of...: Hollygrove

Topographic Quad: New Orleans East ☒ 7.5 ☐ 15

UTM: 15 777250 3318560 11E 12S 30

Owner Name: _____

Owner Address: _____ **Tax Parcel:** _____

Property Information

Type: ☐ Site ☐ Structure ☒ Building ☐ Object

Level Of Recognition: ☐ NHL ☐ NR individual ☐ NR district/element ☐ DOE ☐ Local ☒ None

Previously Surveyed: ☐ Yes ☒ No **When, Located Where?:** _____

Government Preservation Activity: ☒ Section 106 ☐ Grant ☐ Tax Credit ☐ Local Ord ☐ Other

HABS/HAER: ☐ Yes ☒ No **NR eligibility** ☐ Potential individual ☐ Potential district ☒ Ineligible

Condition: ☐ Excellent ☒ Good ☐ Fair ☐ Poor ☐ Ruin

Remark: Well kept

Integrity: ☐ Unaltered ☐ Altered (Historic) ☒ Altered (Non-Historic)

Remark: A carport was added to the front of this house.

Threats: ☐ Abandonment ☐ Neglect ☐ Alteration ☒ Development ☒ Government Action ☐ None

Remark: USACE plans to build a pump station for a canal on this site.

Physical Description

Date of Construction: ☒ Circa ☐ Exact 1950 — Moved: ☐ Yes ☐ No When? _____

Function and Use "P" for Present, "H" for Historic

- __ **domestic**
- PH single dwelling
- __ secondary structure
- __ servant quarter
- __ multiple dwelling
- __ hotel
- __ institutional housing
- __ camp
- __ **commerce/trade**
- __ business
- __ professional
- __ organizational
- __ financial institution
- __ specialty store
- __ department store
- __ restaurant
- __ warehouse
- __ **social**
- __ meeting hall
- __ clubhouse
- __ civic
- __ **government**
- __ capitol
- __ city hall
- __ correctional facility
- __ fire station
- __ government office
- __ custom house
- __ post office
- __ public works
- __ courthouse
- __ education
- __ school
- __ college
- __ library
- __ research facility
- __ **religion**
- __ religious facility
- __ church school
- __ **recreation/culture**
- __ theater
- __ auditorium
- __ museum
- __ sports facility
- __ outdoor recreation
- __ fair
- __ monument/marker
- __ work of art
- __ **agriculture/subsistence**
- __ processing
- __ storage
- __ animal facility
- __ fishing facility
- __ horticultural facility
- __ irrigation facility
- __ **industry**
- __ manufacturing
- __ extractive facility
- __ waterworks
- __ communication facility
- __ processing site
- __ energy production
- __ **health care**
- __ hospital
- __ clinic
- __ sanitarium
- __ medical office
- __ resort
- __ **defense**
- __ arms storage
- __ fortification
- __ military facility
- __ coast guard facility
- __ battle site
- __ **landscape**
- __ park
- __ plaza
- __ garden
- __ **transportation**
- __ rail-related
- __ air-related
- __ water-related
- __ road-related
- __ pedestrian-related
- __ **unknown**
- __ **vacant**
- __ **other** _____

Form and Dimensions

- __ single pen
- __ shotgun
- __ double-shotgun
- __ camelback
- __ double pen
- __ hall-parlor
- __ saddlebag
- __ creole cottage
- __ dog trot
- __ central hall
- __ gable-ell
- __ bungalow
- __ pyramidal cottage
- __ Queen Anne cottage
- __ central-hall, 2 pile cottage
- __ bluffland cottage
- __ central-hall, I-house
- __ double-pen I-pen
- __ hall-parlor I-house
- __ Creole house
- __ central hall, 2 pile house
- __ Queen Anne house
- X four square
- __ minimal tradition cottage
- __ split level
- __ ranch
- __ row house
- __ warehouse
- __ depot
- __ skyscraper
- __ commercial row blg.
- __ freestanding commercial
- __ single-crib barn
- __ traverse-crib barn
- __ other

__H __L
__U __ cruciform
__T __T

__ symmetrical X asymmetrical — __ vertical X horizontal

Height: X1 _1.5 _2 _2.5 _3 _4 _5-10 _10-20 _20+
Width: _1 _1.5 X2 _2.5 _3 _3+
Depth: _1 _1.5 _2 _2.5 X3 _3+

Style

☐ High Style ☐ Elements Of .. ☒ No Style

- __ Creole/French Colonial
- __ Federal
- __ Greek Revival
- __ Gothic Revival
- __ Italian Villa
- __ Exotic Revival
- __ Victorian Gothic
- __ Italianate
- __ Second Empire
- __ Queen Anne
- __ Eastlake/Stick
- __ Shingle Style
- __ Romanesques
- __ Renaissance
- __ Beaux Arts
- __ Colonial Revival
- __ Classical Revival
- __ Tudor Revival
- __ Late Gothic Revival
- __ Mission
- __ Italian Renaissance
- __ French Renaissance
- __ Prairie
- __ Commercial Style
- __ Chicago
- __ Skyscraper
- __ Craftsman
- __ Moderne
- __ Art Deco
- __ International
- __ Other _____

Foundation

- __ post in ground
- __ sill on ground
- __ wooden pier
- __ brick pier
- X concrete block pier
- __ concrete pylon pier
- __ continuous brick
- __ continuous stone
- __ continuous concrete block
- __ concrete slab
- __ unknown

__ w/stone infill
__ w/brick infill
__ w/concrete block infill

Construction

- __ post in ground
- __ post on sill
- __ Log (note notch)
- __ hewn log
- __ french timber frame
- X eastern brace frame
- __ ballon frame
- __ unknown wood frame
- __ load bearing brick
- __ load bearing stone
- __ load bearing concrete block
- __ reinforced concrete
- __ steel frame/curtain wall
- __ unknown construction

__ w/bousillage infill
__ w/brick infill
__ w/ stone infill

Exterior Materials

- __ log (note dressing
- X clapboard/weatherboard
- __ drop/novelty siding
- __ flush horizontal board
- __ vertical board
- __ board and batten
- __ wood shingle
- __ exposed bousillage
- __ stucco
- __ brick (note bond)
- __ stone (note dressing
- __ concrete block
- __ decorative concrete block
- __ poured concrete wall
- __ pigmented glass
- __ glass block
- __ terra cotta
- __ glazed brick/tile/block
- __ sheet metal
- __ enamelled steel
- __ asbestos
- __ aluminum/vinyl siding
- __ asphalt
- __ reconstituted wood siding
- __ permastone
- __ other (see narrative)
- __ unknown

Roof

- __ front gable
- __ side gable
- __ parapet gable
- __ stepped gable
- __ clipped gable
- __ cross gable
- __ gambrel
- X hip
- __ double pitch hip
- __ gable on hip
- __ pyramidal
- __ mansard
- __ complex
- __ round
- __ conical
- __ flat
- __ shed
- __ other (see narrative) w/parapet wall
- __ unknown

X low pitch
__ moderate pitch
__ steep pitch
__

Roof Materials

- __ wood shingle
- __ slate
- X asphalt shingle
- __ asbestos
- __ metal
- X ceramic/terra cotta tile
- __ built up
- __ other
- __ unknown

Chimney(s)

- __ gable end exterior
- __ gable end interior/flush
- __ ridge center
- __ ridge off-center
- __ slope center
- __ slope off center
- __ lateral exterior
- __ removed
- __ other
- __ unknown

Windows

__ batten
__ fixed single
__ fixed divided
__ single-hung
X double-hung
__ triple-hung
__ bay
__ oriel
__ Palladian
__ casement
__ sliding
__ replacement
__ unknown
__ other
__ 1/1
X 2/2
__ 4/1
__ 4/4
__ 6/6
__ 9/9
__ 12/12
__ 2/1
__ 3/1
__ 4/1
__ 6/1
__ 9/1
__ 12/1
__ 9/6
__ multi-
__
__
__ stained
__ diamond
__ unknown
__ other

Doors/Surrounds

1 number
__ batten
__ french
X panel
__ flush
__ glazed
X partially glazed
__ fanlight
__ sidelights
__ transom
X screened
__ replacement
__ unknown
__ Federal
__ Greek Revival
__ Queen Anne
__ other

Porch

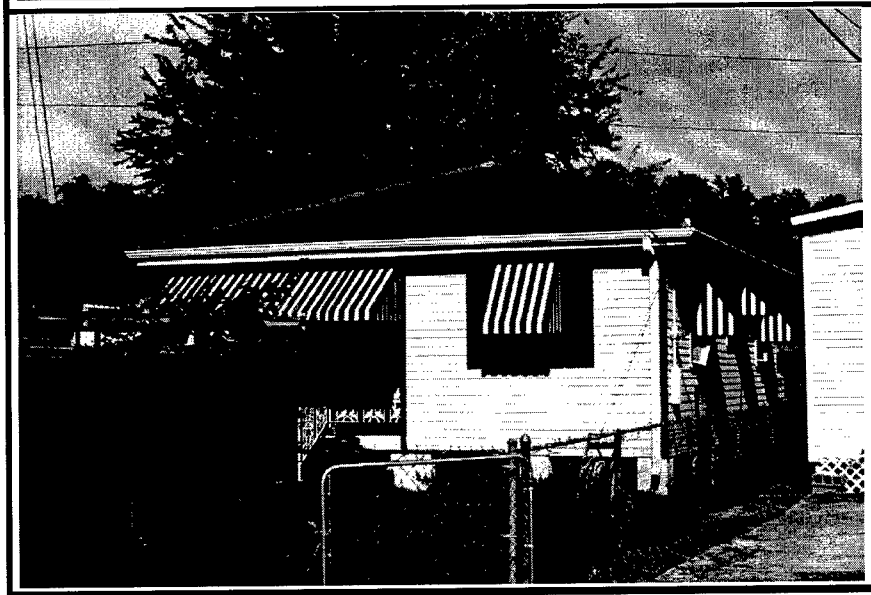
__ gallery
__ portico
__ stoop
__ verandah
__ porte-cochere
__ full width
__ balcony
__ loggia
__ partial width
__ attached
__ integrated
__ wrap
__ peripteral
__ screened
__ enclosed
__ unknown
__ other

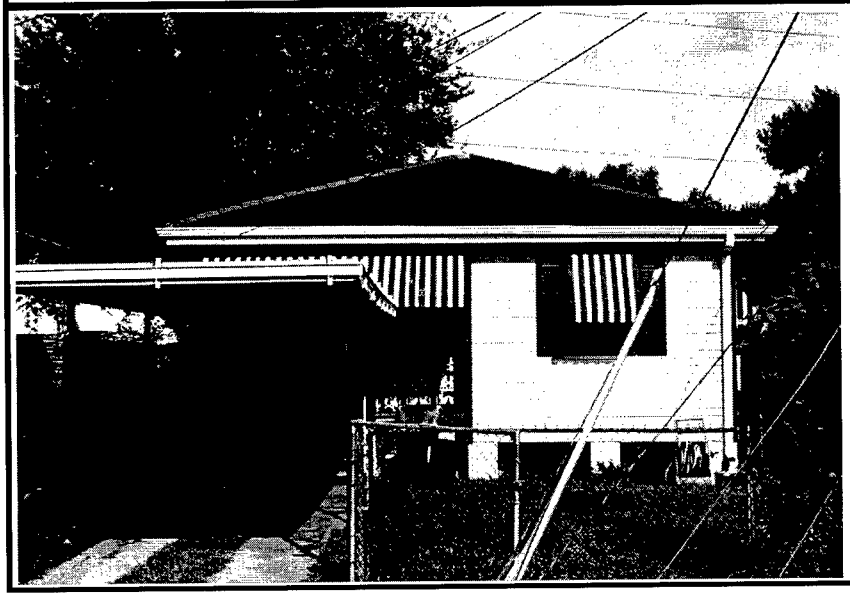
Secondary

__ gallery
__ portico
__ stoop
__ verandah
__ porte-cochere
__ full width
__ balcony
__ loggia
__ partial width
__ attached
__ integrated
__ wrap
__ peripteral
__ screened
__ enclosed
__ unknown
__ other

Additions and Alterations

date	*description*	*impact*
1970	A carport was added on the left front of the house	I M S
		I M S
		I M S
		I M S
		I M S





Context

__ Plantation Agriculture (1750-1945)
__ Creole Architecture (1750-1900)
__ Upland South Culture (1820-1945)
__ New Orleans as Seaport (1718-1945)
__ Transportation Systems (1812-1845)
__ Historic Lumber Industry (1880-1920)
__ Rice Boom (1880-1945)
__ Oil and Gas Industry (1903-1945)
X Anglo-American Architecture (1800-1945)

Significance

__ agriculture
X architecture
__ archaeology
__ art
__ commerce
__ communications
__ community planning and development
__ conservation
__ economics
__ education
__ engineering
__ entertainment/recreation
__ ethnic heritage
__ exploration/settlement
__ health/medicine
__ industry
__ invention
__ landscape architecture
__ law
__ literature
__ maritime history
__ military
__ performing arts
__ philosophy
__ politics/government
__ religion
__ science
__ social science
__ transportation

Narrative

2910 Live Oak Street was most likely constructed in the years immediately following World War II. The house is a one story, two-bay wide, three-bay deep, low pitched hip roof, folk dwelling. It has a wooden frame and a recessed porch on the left front. This is a very common type in Louisiana; it illustrates typical characteristics of mid-twentieth century building techniques. Although broadly associated with the theme of urban development in the city of New Orleans, 2910 Live Oak Street does not appear to possess the qualities of significance and integrity which have been defined by the National Register of Historic Places (Criteria A, B, C, and D).

History

The Hollygrove neighborhood was largely developed in the early to mid-twentieth century. Residential in composition, the neighborhood's architectural specimen's range from shotgun bungalows of the early twentieth century to modern ranches. Many folk types of the mid-twentieth century are represented, including front gable, side gable, and hip roofed examples. Minimal traditional and ranch type houses complete the architectural landscape.

Sources

Godzinski et al, 1999. *National Register Testing for a Railroad Embankment for the Hollygrove Drainage Improvement Feature of the Southeast Louisiana Urban Flood Control Project, Orleans Parish, Louisiana*, submitted to the New Orleans District Corps of Engineers.

Outbuildings

1 - single crib barn | 2 - double crib barn | 3 - transverse-crib barn | 4 - storage/misc. shed | 5 - smoke house | 6 - spring/well house | 7 - corn crib | 8 - coop | 9 - quarters | 10 - garçonnière | 11 - pigeonnier | 12 - kitchen | 13 - office | 14 - machine shed | 15 - garage | 16 - privy | 17 - stable | 18 - other

# 1	# 2	# 3	# 4	# 5	# 6
type:	***type:***	***type:***	***type:***	***type:***	***type:***
date: e/c	***date: e/c***	***date: e/c***	***date: e/c***	***date: e/c***	***date: e/c***
comment:	***comment:***	***comment:***	***comment:***	***comment:***	***comment:***

Site Plan